A MEMOIR OF THE LATE DR. A. H. HASSALL

E. G. CLAYTON

ARTHUR HILL HASSALL

DR. ARTHUR HILL HASSALL

From the Picture in the Board Room at the Offices of the Royal National Hospital for Consumption and Diseases of the Chest, 34, Craven Street, Charing Cross, S.W.

Artist : Signor Italo Sabatini, San Remo, Italy.

Photograph by Messrs. Clark and Mann, 6, York Buildings, Duke Street, Strand.

ARTHUR HILL HASSALL

PHYSICIAN & SANITARY REFORMER

A SHORT HISTORY OF HIS WORK IN PUBLIC HYGIENE, AND OF THE MOVEMENT AGAINST THE ADULTERATION OF FOOD AND DRUGS,

BY

EDWY GODWIN CLAYTON

FELLOW OF THE CHEMICAL SOCIETY; MEMBER OF THE SOCIETY OF PUBLIC ANALYSTS; FELLOW, AND PAST MEMBER OF COUNCIL, OF THE INSTITUTE OF CHEMISTRY; AUTHOR OF ARTICLES IN 'A DICTIONARY OF APPLIED CHEMISTRY,' 'THE ANALYST,' 'THE CHEMICAL NEWS,' ETC.; SOMETIME PUBLIC ANALYST FOR FULHAM

WITH FOUR PORTRAITS, OTHER ILLUSTRATIONS, APPENDICES, AND A BIBLIOGRAPHY

'. . . to preserve the memories of the Dead . . . to present examples to the Living. . . . For Monuments made of Wood are subject to be burnt; of Glass, to be broken; of soft Stone, to moulder; of Marble and Metal (if escaping the teeth of Time), to be demolished by the hand of Covetousness; so that, in my apprehension, the safest way to secure a memory from oblivion is (next his own Vertues) by committing the same in Writing to posterity.'—THOMAS FULLER, D.D. (1608—1661): *The Worthies of England*, Chapter I.

LONDON

BAILLIÈRE, TINDALL AND COX

8, HENRIETTA STREET, COVENT GARDEN

1908

"Non omnis moriar, multaque pars mei
Vitabit Libitinam."

HORATIUS: *Odes*, III., 30, 6.

TO

ARTHUR HILL HASSALL, M.D., M.R.C.P.,

PIONEER IN STATE HYGIENE,
AND AN UNTIRING SEEKER AFTER KNOWLEDGE,

THIS BOOK

IS DEDICATED BY THE WRITER

IN TOKEN OF REMEMBRANCE AND RESPECT.

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PREFACE

In this book an attempt is made to recall and enumerate some of the services rendered to the community by a remarkable man, to whom, probably more than to any other single individual, are owing the comparative purity of our food, the satisfactory quality of the water supplied to London, and various other benefits, which, though lightly appreciated, conduce to the health and welfare of the people.

It has been well and appropriately remarked that Arthur Hill Hassall, "The Apostle of Anti-Adulteration," taught public analysts "most of their knowledge of the microscopic structure of food substances." He "was truly the father of public analysis," and "left his mark beneficially on a number of divisions of natural science, although he had to work under conditions of poverty and ill-health which would have proved an effectual bar to persons less energetic and mentally less active."[1]

In the present memoir, with the Appendices A, B, and C, will be found a history in brief of the events which led to effective public action in Great Britain against the supply of impure water and the adulteration of food and drugs. Sixty years ago there was a crying need for legislation on all kinds of sanitary questions, and not least for civic regulation of the nature and quality of the foodstuffs and medicinal substances sold to consumers. Dr. Hassall's researches and writings, which at first were published in *The Lancet*, and afterwards in a succession of separate publications, put in motion a tremendous reform. The public became thoroughly

[1] *Vide* p. 11, and Appendix B, 13.

aroused: meeting followed meeting: a Parliamentary Committee was appointed to inquire into the evils which Dr. Hassall had exposed; and the parent Act against adulteration soon came into being. The later Acts, including that at present in force, may all be traced to this original; and food analysis has become by degrees, in consequence, one of the most important branches of applied science.

Dr. Hassall's strictures on the condition of the Metropolitan water-supply in the middle of the last century were forceful factors in bringing about the improvement which was gradually shown in the quality of the water of London. His insistence on the necessity of using the microscope in food analysis ultimately led to proficiency in such work being made by the Local Government Board obligatory upon candidates for public analytical appointments; and for some years microscopy has been included among the subjects of the Final Examination of the Institute of Chemistry. Similarly, in the analysis of drugs, Dr. Hassall taught half a century ago that the microscope was of the utmost value in diagnosing character and quality. Somewhat tardily, this has been recognized by the General Medical Council and Pharmaceutical Society, with the result that the microscopical study of powdered drugs at the present time is a prominent feature of the pharmacological curriculum.

A signal service rendered by Dr. Hassall was his keen criticism of the unduly confident statements which at one time were commonly made concerning the nutrient value of "extract of meat." He and others conducted a controversy on this subject in *The Lancet* and elsewhere, in which Baron von Liebig himself took a somewhat inglorious part (Bibliography, p. 75; see also *The Times* of 1872); and it has since been fairly well understood by the public that extract of meat, while useful as a stimulant, is in no sense a complete food.

In his Report on Paraffin Oil (*The Lancet*, 1862), Dr. Hassall did much good by proposing that a "standard of safety" should be adopted with reference to the ignition temperature

of the vapour emitted by the oil. The standard recommended by him was 130° F. For a time this limit was recognized in many quarters, and some public bodies, among them the Town Council of Edinburgh, officially adopted it. After a while, however, the Government fixed a lower standard, 100° F., and, since 1879, a temperature alleged to be its equivalent—namely, 73° F. This is now in use. That a minimum flash-point is compulsory can at least be very largely ascribed to Dr. Hassall's persistent representations on the subject.

Lastly, Dr. Hassall devoted upwards of ten years of his life to the foundation, at Ventnor, Isle of Wight, of the Royal National Hospital for Consumption and Diseases of the Chest. This beneficent institution, admittedly one of the finest in the kingdom, for the relief of those afflicted with pulmonary ailments, is alone an enduring and striking monument to the Founder's energy and public spirit.

The following pages contain an unusually large number of extracts from contemporary journals. The Appendices include quotations from *The Lancet* and other organs relating to Dr. Hassall; to the several Adulteration Acts; to the public testimonial presented in 1856; and to the foundation of the Ventnor Hospital. Also, there will be found a very full, though probably not exhaustive, bibliography of Dr. Hassall's published papers and other works.

Owing to his prolonged residence abroad, before Dr. Hassall's death his services already had been in some measure forgotten. Afterwards, when they had to be recalled, a tendency to depreciate them manifested itself in quarters where such an attitude might least have been anticipated. In view of this fact, one of the objects of the author has been to show by *excerpta*, extending over many years, taken from the great medical journal with which Dr. Hassall was associated for a third of a century, that its own attitude during nearly the whole of that period was one of keen appreciation and emphatic acknowledgment of the valuable work he did for the community and itself; and to

corroborate these extracts by independent testimony quoted from other sources of information.

It has been truly stated, by one who knew him well, that he had no thought but for work: he lived for it; and when he could no longer work, he died.

E. G. CLAYTON.

GLENGARIFF,
KEW ROAD,
RICHMOND, SURREY,
November, 1908.

MEMOIR OF ARTHUR HILL HASSALL

CHAPTER I

PROEM—EARLY INTERESTS AND ENVIRONMENT—DEVOTIO TO NATURAL HISTORY AND MICROSCOPY—MEDICAL TRAINING—KEEN ATTENTION TO QUESTIONS CONNECTED WITH THE PUBLIC HEALTH.

'Thus there are two Books from whence I collect my Divinity: besides that written one of God, another of His servant Nature, that universal and publick Manuscript, that lies expans'd unto the Eyes of all: those that never saw Him in the one, have discover'd Him in the other.'—SIR THOMAS BROWNE (1605-1682): *Religio Medici*, Sect. xvi.

'. . .; neque sordidum quicquam atque immundum, cuius putredine corruptus aer morbum posset inuehere, perferri in urbem sinunt.'—'Nother they suffer anye thynge that is fylthye, lothesome, or vnclenlye, to be brought into the cytie; least the ayre, by the stenche thereof infected and corrupte, shoulde cause pestilente diseases.'—SIR THOMAS MORE (1480-1535): *The Second Boke of Utopia* (RALPH ROBYNSON'S translation, 1551), Chapter V.

IT is meet and fitting that a summary of Arthur Hill Hassall's life-work should appear simultaneously with a book, now being published as a separate treatise,[1] which has been compiled mainly from the results of his own observations of the microscopic structures of foods and drugs. The matter embodied in the accompanying volume manifests only in a very partial degree Dr. Hassall's power as a microscopical observer: it conveys merely one aspect of his varied work in this field of investigation. In zoology, botany, and human anatomy, he conducted with the microscope a large amount

[1] 'A Compendium of Food Microscopy,' by the present writer. Messrs. Baillière, Tindall and Cox, 1908.

of original research, to which only allusion can be made in the following chapters.

At the time of his death, at San Remo, on April 9, 1894, Dr. Hassall was in his seventy-seventh year, having been born at Teddington, Middlesex, on December 13, 1817. His grandfather, father (Thomas Hassall), and elder brother (Richard) were also medical men. Thomas practised for many years at Teddington, but Arthur was sent to study medicine in Dublin under an uncle, Sir James Murray, M.D., and received his first diploma (in midwifery) as long ago as 1837. He became M.R.C.S. in 1839, L.S.A. in 1841, M.R.C.P. in 1851, and obtained the M.B. and M.D. degrees of London University in 1848 and 1851 respectively. Having begun as a general practitioner in 1843, he was actively engaged as a consulting physician till within five weeks of his death, fifty-one years later.

During more than half a century Dr. Hassall rendered manifold and important services, some of which, it is to be feared, are in danger of being completely forgotten. From the wide range of his work, the variety of subjects which attracted him, and the extraordinary ardour with which he pursued them, in spite of wretched health and, in early life, narrow means, he was truly a remarkable man. This sketch is intended to recall some of his practical services to the community, rather than to review critically his work in pure science; but many papers, contributed during a long series of years to the Royal, Linnæan, Medical, Royal Medical and Chirurgical, Royal Microscopical, and other societies, and numerous monographs in the *Annals of Natural History*, the *British Medical Journal*, the *Lancet*, and elsewhere, testify to his acuteness of observation and love for scientific investigation. While a student in Dublin, and for years afterwards, he passed nearly all his leisure in zoological and botanical pursuits, the fruits of which appeared in a great succession of papers, extending over a long period. He made an especial study of the marine fauna of the Wicklow coast, and on his return to England followed this up by an exhaustive investigation of English freshwater weeds. These and kindred tastes

never left him. He discovered a large number of new species of algæ and zoophytes;[1] and perhaps as clear a proof as could be adduced of the value of his biological work is the fact that the Rev. M. J. Berkeley, a very high authority on the subject, named after him an important genus of confervoid algæ.[2] Professor Forbes, Dr. G. Johnston, of Berwick, and others, also associated his name with numerous species of algæ and marine zoophytes. Hassall's 'History of the British Freshwater Algæ,' published in 1845, is a classic, and still a standard book of reference.[3] The letterpress, the drawing of the 103 plates, and the engraving, were all by himself.

In B. D. Jackson's 'Guide to the Literature of Botany' (1881), this work is asterisked as one of the 'books especially noteworthy.'

As a practical microscopist, it is doubtful whether Dr. Hassall has ever been surpassed; and another early treatise, afterwards republished in Germany and the United States, 'The Microscopic Anatomy of the Human Body' (1849), was the result of several years' labour and minute research. It included hundreds of beautiful figures, drawn from the author's own preparations by Mr. Henry Miller, whom he had personally trained in this class of work. Various original observations and discoveries in human histology, such as

[1] 'Mr. Arthur H. Hassall, whom I claim as my pupil in zoophytology, nd likely ere long to surpass his master therein. . . .'—Preface to Dr. G. Johnston's 'A History of British Sponges and Lithophytes,' 1842.

[2] 'The genus *Hassallia*, of Berkeley, is the reward of his services to science.'—Dr. G. Johnston, 'A History of the British Zoophytes,' second edition, 1847, i. 272.

The generic name *Hassallia* has received three different applications, by authors of as many nationalities; for details, *vide* the 'Note' on p. 60.

[3] The principal books on the subject published during the past sixty years abound in allusions to Hassall's researches in this branch of natural history. [See Count Vittore B. A. Trevisan's *Saggio di una Monografia delle alghe Coccotalle* (Padova, 1848); *Species Algarum*, 1849, by F. T. Kützing; *Index Generum Algarum*, 1860, by W. H. Harvey, F.R.S.; *A Handbook of British Water-Weeds or Algæ*, 1864, by J. E. Gray, F.R.S.; E. Bornet and C. Flahault's *Révision des Nostocacées Heterocystées*, 1886-88; etc. See also *The Beginnings of Life*, 1872, vol. i., pp. 173-177, by H. Charlton Bastian, F.R.S., where there is a quotation from Dr. Hassall's account of the formation of the spore in the alga *Vaucheria* ('History of the British Freshwater Algæ,' 1845, p. 16).] Many of the specimens collected by Hassall, and described in his book, are now carefully preserved in the Department of Botany at the Natural History Museum, South Kensington, S.W.

the 'Hassallian corpuscles' (so named by F. G. J. Henle, C. G. Lehmann, and others).[1] are recorded in this and other of his works; but such matters are outside the range of the present memoir, which is necessarily brief.

Dr. Hassall's most conspicuous public services, by which the community has directly or indirectly benefited, are here enumerated:

1. *Work as a sanitary reformer;* including especially the advocacy of a complete reform in the Metropolitan water-supply.

2. *Investigations in connection with the cholera epidemic of* 1853-54; the results possessing much importance and interest, as foreshadowing and almost anticipating a famous German discovery of a much later date. Of this more anon.

3. *Achievements as a pioneer and leader*, and as the principal scientific *worker*, in the anti-adulteration struggle of 1850 and the following years.

4. *The application of the microscope, for the first time on an important scale, in the analysis of food and drugs, and in the determination of the exact nature of the living organisms found in water supplied for the public use.* Excepting for the purpose of biological research, and as a scientific toy, the microscope previously had been almost entirely neglected; and with Dr. Hassall unquestionably rests the honour of having in 1850 first shown it to be, not merely an indispensable adjunct to the analysis of most foods and many drugs, but also in numerous instances a more effective apparatus in the detection of adulteration than the test-tube and retort. It is now generally recognized that there are many admixtures which chemical tests alone are powerless to identify.

5. *The conception and foundation of an institution*, for the sheltering and treatment of sufferers from pulmonary consumption, which has served as a pattern to similar institutions in various parts of the world, and has relieved many

[1] Descriptions of the 'concentric corpuscles of Hassall' are given in W. D. Halliburton's *Handbook of Physiology*, 1907, pp. 334, 882; E. A. Schäfer's *Essentials of Histology*, 1907, p. 211; L. Landois and W. Stirling's *Text-Book of Human Physiology*, 1891, p. 173; Quain's *Elements of Anatomy*, edited by E. A. Schäfer and G. D. Thane, 1893, vol. iii., p. 308, etc.

thousands of afflicted people during a period of nearly forty years.

6. *The forcible advocacy of a standard flash-point for petroleum*, a reform which was eventually adopted.

7. *Cautionary advice concerning* '*extracts of beef*,' which, in opposition to ideas prevalent at the time and fostered by interested vendors, Dr. Hassall showed to be deficient in the nutritive elements of food.

Hassall's work in public hygiene may be said to have begun in 1849 with the publication of a pamphlet on the then notoriously unhealthy state of a neighbourhood close to his own residence.[1] Before the year 1850 loud had been the complaints of the disgraceful condition of the water supplied to London; and in that year Dr. Hassall contributed to the *Lancet*[2] an article on this subject, followed by a little book, with twelve coloured plates, entitled 'A Microscopic Examination of the Water Supplied to the Inhabitants of London and the Suburban Districts,' making public for the first time the excessive quantities of organic refuse and infusorial life present in the water, and showing their real significance.[3] This attracted much attention, and in particular that of Sir Edwin (then Mr.) Chadwick, a member of the General Board of Health. At his request, Dr. Hassall furnished the Board with much evidence on the subject of the organic impurities in the water then supplied by the Metropolitan companies;[4] and in the following year, 1851,

[1] 'Observations on the Sanitary Condition of the Norland District, Shepherd's Bush, and Pottery, with Suggestions for its Improvement,' 1849.

[2] The *Lancet*, 1850, i. 230.

[3] 'The true interpretation to be placed on the presence of infusoria in water was not well understood until Dr. Hassall called particular attention to the condition of animalcular life in Thames water near to London. . . . This inquiry belongs to the naturalist, the physiologist, and the microscopist, and to Dr. Hassall is due the honour of having first applied the resources of these, extensively, and in a practical as well as a scientific manner, to an examination of the actual condition of water in general, and particularly the state of that now in use in the Metropolis.'—The *Lancet*, 1851, i. 188, 189.

[4] General Board of Health, 'Report on the Supply of Water to the Metropolis,' 1850, Appendix No. III. (Reports and Evidence), p. 29.

The General Board of Health 'came to the conclusion that the whole of the present supplies are bad in quality, and that new and more wholesome sources ought to be obtained. This conclusion . . . was the result of mature

he was a chief witness before the Parliamentary Committee of Inquiry into the Metropolitan Water-Supply, presided over by Sir James Graham, Bart.[1] A later report by Dr. Hassall, 'On the Microscopical Examination of the Metropolitan Water-Supply,' addressed to the Right Hon. William Cowper, M.P., President of the General Board of Health in 1857, appeared among the Parliamentary papers of that year[2] (see the *Times*, April 27, 1857, and the *Lancet*, 1857, i. 467). He was also author of a 'Report, Microscopical and Chemical, on the Water of the Serpentine,' drawn up at the request of Sir Benjamin Hall, Bart., M.P., presented to the House of Commons, and ordered to be printed (1857).[3]

During the cholera epidemic of 1853-54, Dr. Hassall was Medical Inspector under the General Board of Health (of which Sir Benjamin Hall was then President), and had charge of two Metropolitan districts, severely visited by the disease. He was also appointed, in conjunction with Dr. R. Dundas Thomson and Mr. J. Glaisher, F.R.S., as colleagues, to conduct scientific inquiries in connection with the epidemic. The microscopical portion of the investigations devolved upon Dr. Hassall, who now made a minute examination of the water supplied by all the Metropolitan companies,

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deliberation, and founded on the evidence of gentlemen of known ability, reputation, and knowledge of the subject: Dr. Sutherland, Mr. P. H. Holland. Dr. Hassall, Dr. Gavin, Dr. Lyon Playfair, Dr. Angus Smith, Professor Way, Professor Clark, Professor Hofmann, and many others.'—The *Lancet*, 1851, i. 498, leading article on the Metropolitan water-supply.

[1] 'Reports of Commissioners,' 1851, vol. xv.—'Minutes of Evidence taken before the Select Committee on the Metropolis Water Bill,' p. 227.

Dr. Hassall's 'attention had for many years been occupied by an analysis and investigation into the subject of the water-supply of the Metropolis, the result of which research, when given in evidence before the House of Commons, led ultimately to important improvements in the supply of that great essential to life.'—The *Lancet*, 1864, ii. 276.

[2] 'Report to the Right Hon. William Cowper, M.P., President of the General Board of Health, on the Microscopical Examination . . . ,' etc., by A. H. Hassall, M.D., F.L.S., January 31, 1857; Eyre and Spottiswoode.

'Dr. Hassall's report deserves the attention of all water-drinkers, as well as of public and official authorities.'—The *Literary Gazette*, 1857, p. 422: Review of Dr. Hassall's 'Report on the Metropolitan Water-Supply,' 1857.

[3] The *Lancet*, 1857, ii. 60: *vide* also the *Lancet*, 1850, ii. 64, and the *Times*, July 6, 1850, for a paper 'On the Colouration of the Water of the Serpentine,' read on July 5, 1850, before the Botanical Society of London.

and derived from various deep and shallow wells, the report being detailed and exhaustive. Investigations followed of the excretions and blood of cholera patients, and of the clothes of victims to the scourge. So great was the popular dread of cholera at the time that the autopsies frequently

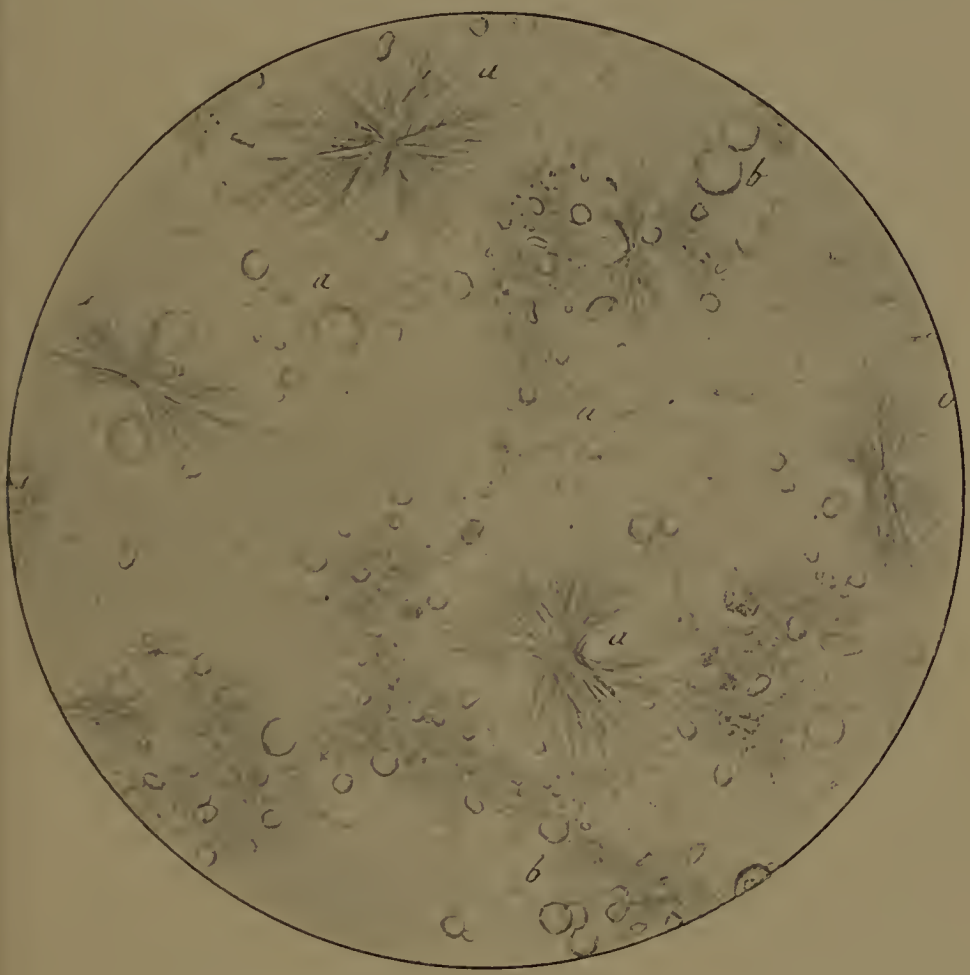

FIG. 1.—RICE-WATER DISCHARGE OF CHOLERA, SHOWING ORGANISMS RESEMBLING THE COMMA BACILLUS.

a, *a*, groups of acicular crystals; *b*, *b*, globules of oil; *c*, *c*, the bacilli.

had to be made by Dr. Hassall in the dead-houses alone, without even the assistance of a porter.

The reports[1] setting forth the results of these inquiries

[1] General Board of Health, Medical Council, 'Report of the Committee for Scientific Inquiries in Relation to the Cholera Epidemic of 1854.'—Reports of Commissioners,' 1854-55, vol. xxi.

included some finely executed coloured plates, in several of which (representing the 'rice-water' discharges, etc., of cholera patients) were shown, and referred to under the then general name of 'vibriones,' *bacilli*, among them the curved organism, to which Koch has since (1884) given the name of 'comma' bacillus (*Spirillum choleræ Asiaticæ*). Two of the plates are here reproduced, by permission of the Controller of His Majesty's Stationery Office (Figs. 1 and 2). These investigations were carried out during the year 1854, and the reports were dated, respectively, December 21, 1854 (water), and January 22, 1855 (blood and dejecta). Hence it is apparent that the presence of the cholera bacillus was observed, recorded, and figured by Hassall fifty-four years ago.[1] The following is a short extract from his report on the rice-water discharges: 'We have next to inquire what is the origin or source of these vibriones, and what is their relation to cholera? . . . . It is perfectly certain that they do frequently gain admission through some of the impure waters consumed, in which I have not unfrequently detected the presence of vibriones, sometimes in considerable numbers. Once introduced into the alimentary canal, they are brought into contact with conditions highly favourable to their development and propagation, both of which take place with extraordinary rapidity. . . . Without, however, at all supposing that there is an essential or primary connection between these vibriones and cholera, their occurrence in such vast numbers in the rice-water discharges of that disease *is not without interest and possibly is of importance*.' (The italics are the present writer's.) '. . . If these vibriones possess any influence on the production of cholera . . .,' etc.

[1] Reviewing Dr. Hassall's 'Narrative of a Busy Life,' the *Dublin Journal of Medical Science* (1894, xcvii. 259, 260) said: 'He also examined microscopically at this time [1854, E. G. C.] the characteristic discharges in cholera, detected "vibriones" in great abundance, pointed out that the presence of an alkaline fluid was necessary to their development, and thus explained the value of sulphuric acid in checking the diarrhœa of the disease. In this investigation he *almost* anticipated Koch's discovery of the specific bacillus of cholera. "From the characters exhibited," he says, ". . . and from their general agreement with Koch's description, there is not the smallest doubt that the cholera bacillus was present in the discharges in nearly every case, and was first seen by me during the choiera epidemic of 1854."

It is evident that, although Hassall did not express a positive opinion as to the significance of the vibriones, his observations went far beyond those of F. Brittan and J. G. Swayne, of Bristol (1849), to whom, and to Dr. W. Budd, has been attributed the first suggestion that cholera was due to microscopic fungi, and (on insufficient grounds) the discovery of

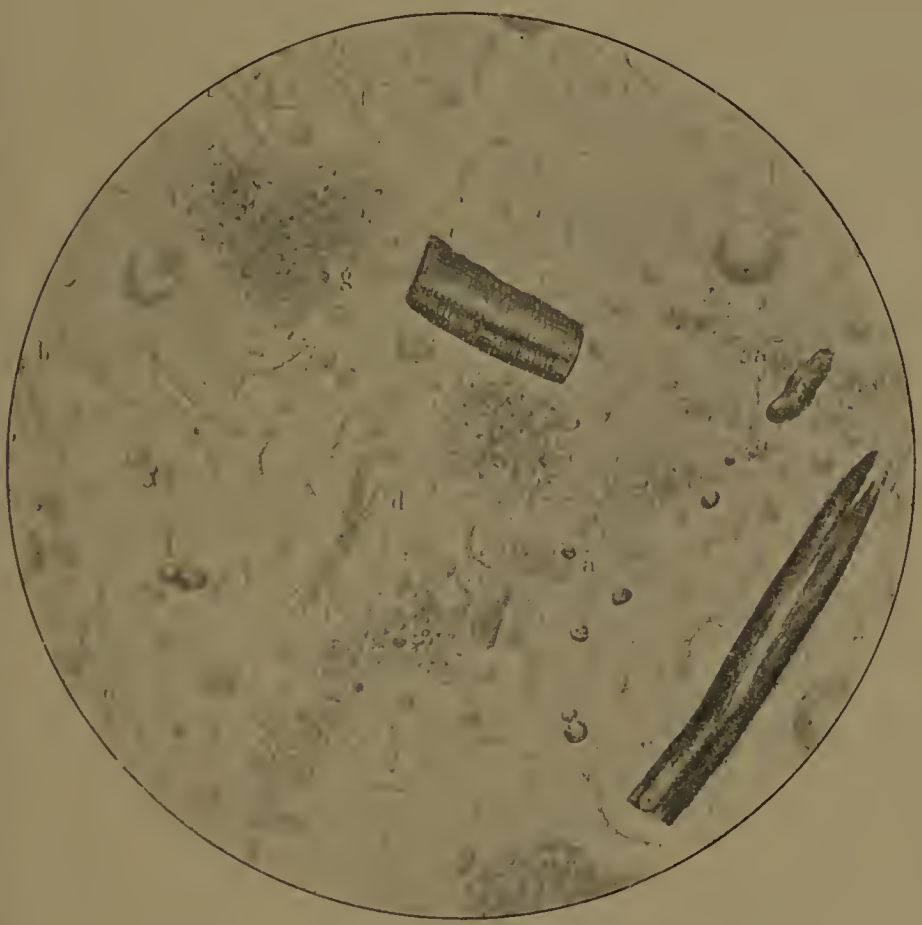

FIG. 2.—RICE-WATER DISCHARGE OF CHOLERA, SHOWING ORGANISMS RESEMBLING THE COMMA BACILLUS.

a, *a*, granular corpuscles, single and aggregated; *b*, *b*, mucus; *c*, *c*, oil globules; *d*, acicular crystals; *e*, *e*, muscle fibres; *f*, *f*, and *g*, *g*, bacilli.

these minute organisms in the rice-water discharges. This supposed discovery, previously announced in the *London Medical Gazette* and in the *Morning Chronicle* of September 21, 1849, was described in the *Times* of September 26, 1849, by Dr. Budd, to whose communications reference was again

made, at a comparatively recent date, in a leading article in that journal.[1] But, as was pointed out in this article, it 'may be questioned whether Dr. Budd really saw the cholera bacillus.'[2] Dr. Hassall in 1884[3] claimed to have been the first to observe and draw attention to the presence of bacilli in the rice-water evacuations, and this claim certainly has a very strong foundation.[4] The following are the facts: Drs. Swayne and Brittan, in June, 1849, announced before the Bristol Medico-Chirurgical Society, the discovery of certain fungoid bodies in the rice-water dejecta. Drawings of the forms were shown. Dr. Brittan and Dr. W. Budd afterwards found similar bodies in air. This was followed by a paper in the *London Medical Gazette*,[5] entitled 'Report of a Series of Microscopical Investigations on the Pathology of Cholera,' by F. Brittan, M.D. The plates showed annular bodies, some lunar or semilunar in shape. But Busk's and Lankester's communications[6] threw grave doubt on the supposed nature of these bodies, which Swayne in his reply[7] stated to be twelve times as large as Uredo cells. If this were the case, they could not possibly be the far more minute vibriones, or bacilli of cholera. In these circumstances, even if the original suggestion that cholera was due to a fungus were Dr. Budd's (and this is extremely doubtful), the first to see the bacillus was undoubtedly Hassall, whose claim remains perfectly valid.[8]

[1] The *Times*, September 29, 1894.

[2] Careful investigation of the subject, and reference to the original papers, convincingly show that he did not.

[3] The *Lancet*, 1884, ii. 38, 167, 847.

[4] 'It is, we confess, highly probable that what Dr. Koch saw in 1883 Dr. Hassall perceived in 1853 . . .'—The *Lancet*, 1884, ii. 377.

[5] N. S., 1849, ix. 530.

[6] *Lond. Med. Gaz.*, N. S., ix. 692, 733, 772.

[7] *Ibid.*, pp. 860-950.

[8] A similar claim was made in 1884 by Dr. Aurelio Bianchi for the then recently deceased Professor Filippo Pacini of Florence, who during the cholera epidemic which prevailed in that city in *1855* had observed in the cholera dejecta 'small granular bodies composed of round cells resembling the *Bacterium termo*' (*Lancet*, 1884, ii. 240). Pacini's *first* microscopical examination was made on the body of a person who died on February 12, 1885 (*Lancet*, 1884, ii. 706). Dr. Hassall's observations were made during the epidemic of *1854*, several months earlier. Obviously, therefore, he anticipate Pacini.

CHAPTER II

THE GENESIS OF THE ADULTERATION ACTS: DR. HASSALL'S WORK.

'For the high business of the public good.'
JOHN DYER (1701-57) *The Fleece*, II., line 493.

'. . . hoc vincite, cives,
Et prohibete nefas.'
VERGIL, *The Æneid*, V., lines 196, 197.

CONSIDERATION may now be given to Hassall's part in the campaign against adulteration, begun in 1850, and carried on almost continuously till 1860, the year in which the first Adulteration Act was passed. Besides doing so much other work, winning him an honourable place among soldiers of sanitation, Hassall personally laboured harder and more systematically than any of his contemporaries to pave the way for English legislation against the adulteration of food, drink, and drugs. Although this was but an episode in a long career of multiform energy and usefulness, so prominent was the part he filled as the 'Apostle of Anti-adulteration,'[1] that to some extent it has obscured the public recollection of his other work, medical and sanitary, and hindered recognition of its usefulness.

[1] The *Medical Press* (April 18, 1894) thus wrote of him: '*The Apostle of Anti-adulteration*. . . . In him a very notable man . . . passed away; he may be said to have been the father of the anti-adulteration law of Great Britain, and the progenitor of all public analysts and other officers whose function it is to protect the public against adulteration frauds. . . . Hassall was pelted with abuse, and the *Lancet* overwhelmed with threats of actions by those who were making large fortunes by this method of swindling; but with remorseless determination they kept "hammering away" until they succeeded in making the iron red hot, and forcing the public to listen, and the Legislature to interfere for the protection of the consumer. It is no hyperbole for us to say that there is not a man, woman, or child in Great Britain who has not deep occasion to bless the name of Arthur Hill Hassall, and to honour the *Lancet*, which so nobly and unflinchingly supported him. . . .'

More than once, prior to 1850, attention had been directed spasmodically to the subject of the adulteration of food: as early as 1757, with especial reference to bread, by an anonymous writer, 'My Friend, a Physician' (Dr. Wilkinson), and by Drs. Peter Markham and James Manning, the former of whom, in the following year, published a quaint little volume on the subject, entitled 'Syhoroc.' These authors of the Georgian era named nearly a dozen ingredients, which they stated were employed in the adulteration of bread; among them beans, chalk, whiting, slaked lime, alum, and bone ashes. Referring to the 'old ground bones' alleged to be used, 'My Friend, a Physician,' writes: 'The charnel-houses of the dead are raked to add filthiness to the food of the living.' And besides the adulterants of bread already named, Dr. Markham, in 'Syhoroc,' mentions *soap*, as well as certain 'ingredients not to be divulged, and their evil effects upon human health, sudden death' (!). The titles of some of these literary productions are noteworthy. It will be seen that they are sufficiently horrifying:

'Poison Detected: or Frightful Truths; and Alarming to the British Metropolis. In a Treatise on Bread.' By 'My Friend, a Physician' (Dr. Wilkinson), 1757.

'A Letter to the Rt. Hon. William Pitt, Esq.: relating to the Abuses practised by Bakers and others.' Peter Markham, M.D., 1757.

'The Nature of Bread, Honestly and Dishonestly Made.' James Manning, M.D., 1757.

'Syhoroc: or, Considerations on the Ten Ingredients used in the Adulteration of Bread-flour and Bread.' Peter Markham, M.D., 1758.

'A Final Warning to the Public to avoid the Detected Poison.' By P. Markham, M.D., 2nd edition, 1758.

'Public Villainy Exposed; Or a Discovery of the Different Adulterations and Poison in Bread, by Dr. ****** of Bath.' A broadsheet; *circa* 1800.

During the first half of the nineteenth century, Drs. Jonathan Pereira, Andrew Ure, and others, wrote on the adulteration of

various articles of food. In the year 1820 had appeared the celebrated book, by a well-known chemist and technologist of that day, Friedrich Christian Accum, F.L.S., in the preface to the first edition of which was quoted the scriptural text, 'There is death in the pot' (2 Kings iv. 40), often incorrectly cited as the title of the work.[1] John Dingwall Williams, writing under the pseudonym, 'An Enemy of Fraud and Villany,' followed in 1830 with 'Slow Poisoning; or, Disease and Death in the Pot and the Bottle.' During the same year W. B. O'Shaughnessy, M.D., at the request of Mr. T. Wakley, M.P., editor of the *Lancet*, made some analyses of confectionery, the results of which appeared in that journal, in 1831, in the form of an article 'On Poisonous Confectionery.'[2] In 1836 some further analyses were stated to have been made by Mr. T. H. Henry (afterwards F.R.S.), on the suggestion of the editor of the *Lancet*, who also, about twelve years later, appears to have contemplated the publication of a journal especially dealing with adulteration, but neither the analyses nor the journal ever saw the light. In 1848 appeared John Mitchell's 'Treatise on the Falsifications of Food,' followed in 1850 by the more ambitious works of Alphonse René Normandy, M.D.,[3] and Jean Baptiste Alphonse Chevallier,[4] in which many chemical methods were described for the discovery of adulterations.

The microscope seems to have been quite disregarded by most of the earlier investigators. During the years 1843-48, however, A. R. Normandy, Andrew Ure, and Alfred Donné used it for the identification of some of the starches; and John Thomas Quekett (who lectured on histology and catalogued the histological series at the Royal College of Surgeons) in 1850 proposed its employment as a means of discovering frauds: but there was as yet no systematized

[1] The exact title of this book (both editions) is 'A Treatise on Adulterations of Food and Culinary Poisons,' by Fredrick (*sic*) Accum. In the second edition the words of the biblical quotation are inserted in an engraved allegorical device on the title-page.

[2] The *Lancet*, 1830-31, ii. 193.

[3] 'The Commercial Handbook of Chemical Analysis,' 1850.

[4] 'Dictionnaire des Altérations et Falsifications des Substances Alimentaires Médicamenteuses et Commerciales,' 1850.

observation and scientific description of the minute structures of food-stuffs, nor any attempt at a general application of the instrument in the analysis of food and drugs. Moreover, the references to the microscope, in the works of Normandy and the other writers on food, are vague and imperfect, and convey an impression of perfunctoriness.

These several efforts led to no practical result, and were merely skirmishes preceding the stern and organized warfare to be begun at the end of 1850. In fact, it was not until thirty years after the publication of Accum's book, and nineteen years from the appearance in the *Lancet* of O'Shaughnessy's paper, that the campaign against food-adulteration can be affirmed seriously to have been reopened. Yet this kind of fraud in those days was scandalously common: hardly any article of food or drink appears to have been exempt. It is probably the case, as a witness asserted before the Parliamentary Committee appointed fourteen years ago to inquire into the working of the Sale of Food and Drugs Act of 1875, that people nowadays are cheated rather than poisoned:[1] but it is certain that in the thirties, forties, and early fifties they were both poisoned and cheated. If honour be due to one who has a leading part in the accomplishment of a reform of lasting benefit to the community, it must be accorded to the man in consequence of whose energy it is that the second of these statements no longer applies.[2]

On August 2, 1850, Dr. A. H. Hassall, stimulated by an astonishing statement which had been made in the House of Commons by the Chancellor of the Exchequer (the Right Hon. Sir C. Wood, Bart.) to the effect that 'neither by chemical nor by any other mode could it be ascertained with any degree of certainty whether a mixture contained chicory or not,'[3] read before the Botanical Society of London

[1] Select Committee on Food Products Adulteration, July 31, 1894.—Mr. Herbert Preston-Thomas's reply to Question 14.

[2] To take one instance alone, the freedom of pickles from copper, at the present day. It has been well said that 'mainly through Dr. Hassall and Messrs. . . . , apparatus of wood, stoneware, and even silver and platinum have displaced copper in making pickles.'— Dr. S. Rideal, 'Disinfection and the Preservation of Food,' 1903, p. 412.

[3] 'Hansard's Parliamentary Debates,' Thursday, May 23, 1850.

a paper on 'The Adulteration of Coffee,'[1] which was widely reported, and attracted much public attention. This was followed by the preparation of a paper on impurities in sugar; and a few days later, on August 13, 1850, it was agreed, as the result of communications between the editor of the *Lancet* and Dr. Hassall, that the latter should prepare a series of articles embodying the results of analyses of samples of food, beverages, and drugs, of all kinds, to be purchased at various shops in and around London: these articles to be styled the 'Reports of the *Lancet* Analytical Sanitary Commission' (a name proposed by the editor), to appear periodically and frequently, and to include the names and addresses of vendors of adulterated samples, the editor of the *Lancet* bearing all expense and legal responsibility.[2] On December 14, 1853, a further agreement[3] was signed, giving Dr. Hassall the sole right of separately republishing these reports from January 1, 1851, to December 31, 1854, in his own name, as 'Chief Analyst to the Commission,' and under the title of 'Food and its Adulterations.' The articles in question, which were models of lucidity and completeness, appeared at short intervals for more than four years,[4] and included very many original observations and discoveries; among them the detection, in January, 1851, of the sugar mite, *Acarus sacchari*,[5] in enormous numbers in the common brown, raw sugar, then largely consumed in London and elsewhere (the *Lancet*, 1851). This discovery undoubtedly had much to do with the general adoption of refined sugar, in place of the crude, impure product previously used. Again, various results of great importance, showing the disgraceful sophistications of coffee, milk, cocoa, tea, patent foods, bottled vegetables and fruits, cayenne pepper, potted meats, etc., were described in the original reports and in 'Food and its Adulterations.' In one of these reports

[1] The *Times*, August 5, 1850.

[2] A responsibility which Dr. Hassall afterwards took upon himself in great measure, by the republication of the reports in book form.

[3] *Vide* Appendix Aii.

[4] The first was published in the *Lancet* of January 4, 1851.

[5] Since named *Glyciphagus cursor*, etc.

(*Lancet*, September 20, 1851) mention is made of the use of a preservative in milk (sodium carbonate), the statement being quoted from Dr. Normandy's work, published during the previous year (*op. cit.*, p. 375). The employment of another ingredient, milk of almonds, presumably for the same purpose, is quoted from Mitchell's book, published in 1848. These early references to the use of food-preservatives are interesting in view of the enormous importance which the subject has since assumed. Lastly, so amazing and shocking were the revelations of the extent to which sugar confectionery was then coloured by poisonous ingredients that they virtually led to the practice receiving its death-blow.

The literature of the time abounds in allusions to this prevalent evil. Thus the Rev. Charles Kingsley, in 'The Water Babies' (published in 1863, chapter viii.), remarks: '. . . People make . . . trash full of lime and poisonous paints, and actually go and steal receipts out of old Madame Science's big book to invent poisons for little children, and sell them at wakes and fairs and tuck-shops. . . . Dr. Letheby and Dr. Hassall cannot catch them, though they are setting traps for them all day long.'

Nearly fifty years after, much of Dr. Hassall's work has an important place in the 'Report of the Departmental Committee on the Use of Preservatives and Colouring-Matters in Food,' issued in 1901. Appendix X. to this Report is called 'An Historical Record of the Use of Preservatives and Colouring-Matters in Food, gleaned from the volumes of the *Lancet* from 1851 to the present time.' The greater part of the facts here recorded were discovered and described by Dr. A. H. Hassall, whose name, nevertheless, is not even once mentioned. Here, indeed, is the play of 'Hamlet,' with the part omitted! Yet there is an ample reference to another well-known chemist who in 1853 addressed a short letter to the *Lancet* on the presence of copper in some preserved fruit: The bulk of this Appendix—at all events, the most interesting part of it—is compiled from the reports, written for the *Lancet* by Dr. Hassall, and embodying the information mainly brought to light by his own intense labour. This can be

proved by a reference to his book, 'Food and its Adulterations,' which is a reprint of the *Lancet* articles.

It can well be believed that the publication in the *Lancet* of Dr. Hassall's great series of articles, and their reappearance in book-form at the beginning of 1855, created in many quarters excitement the reverse of pleasurable, and attracted universal attention.[1] The following extracts from reviews and journals of the period will give some idea of the deep and general impression made by these disclosures:

> 'General denunciations of grocers did not touch individuals of the craft, and they were consequently not driven to improve the quality of their wares. The *Lancet* Commission went to work in a different manner. . . . Dr. Hassall, like a modern Al Raschid, perambulated the town himself, or sent his trustworthy agents to purchase articles, upon all of which the inexorable microscope was set to work; and every fraudulent sample, after due notice given, subjected its vendor to

[1] 'That the subject of the adulteration of food should not sooner have engaged the attention of our Boards of Health is perhaps not so surprising when it is considered that, until lately, the data did not exist by which the nature of the adulterations practised, and the extent to which they prevail, were made known. This information has now been supplied to a considerable extent, through the unceasing labours of the Analytical Sanitary Commission, published in this journal during the past four years. In connection with these labours, *we consider that the time has now arrived when the name of Dr. Arthur Hassall should be mentioned, on whom these inquiries have almost exclusively devolved* [the italics are the present writer's], and to whom belongs the credit of having brought to light practices in relation to the adulteration of food of the highest importance, and of the extent and nature of which no one previously entertained any adequate conception. It is almost impossible to overestimate the importance of these labours, either in a pecuniary or sanitary point of view, both as regards the public and the medical profession. To Dr. Hassall, then, we would say, belongs the merit of having established in this country a new and distinct department of public hygiene.'—The *Lancet*, 1854, ii. 152: leading article on the appointment of the new Board of Health, presided over by Sir Benjamin Hall.

'The publication of these papers marked a new era in legal medicine and the investigation of foods, and the technical application of the microscope was fully developed in the English use. It was not so, however, among Continental chemists, for Hureaux in his "Histoire des Falsifications," published in 1855, scarcely mentions the microscope. . . . This is the more curious, since the author was aware of the evidence given before the Select Committee, as is obvious from more than one reference.'—'Foods: Their Composition and Analysis,' by A. Wynter Blyth, fourth edition, 1896.

be framed for ever to the terrible pages of the Commissioners' Report. In this manner direct responsibility was obtained. If the falsification denounced was not the work of the retailer, he was glad enough to shift the blame upon the manufacturer, and thus the truth came out.

'A gun suddenly fired into a rookery could not cause a greater commotion than this publication of the names and addresses of dishonest tradesmen; nor does the daylight, when you lift a stone, startle ugly and loathsome things more quickly than the pencil of light, streaming through a quarter-inch lens, surprises in their naked ugliness the thousand and one illegal substances which enter more or less into every description of food that it will pay to adulterate. Nay, to such a pitch of refinement has the art of falsification of alimentary substances reached, that the very articles used to adulterate are adulterated; and, while one tradesman is picking the pockets of his customers, a still more cunning rogue is, unknown to himself, deep in his own.

'It is in the application of the microscope that consists Dr. Hassall's advantage over all previous investigators in the same field. The precision with which he is enabled to state the result of his labours leaves no appeal. . . . Many manufacturers and retailers, who have been detected falsifying the food of the public, have threatened actions, but they all flinched from the test of this unerring instrument.

'If we could possibly eliminate from the mass of human disease that occasioned by the constant use of deleterious food, we should find that it amounted to a very considerable percentage on the whole, and that one of the best friends of the doctor would prove to be the adulterator. But even our refuge fails us in our hour of need: the tools of the medical man . . . often turn out to be worthless drugs; and medical comforts are adulterated as extensively as any other articles.

'We cannot avoid stating that the community is under the greatest obligation to both Dr. Hassall and

the editor of the *Lancet;* to the one for the energy with which he pursued his subject, and to the other for his singular boldness in rendering himself liable for the many actions which the publication of the names of evil-doers was likely to bring upon his journal—a liability which Dr. Hassall has since taken upon himself by the reprint of the Reports under his own name. We have shown enough to convince the public that the greatest fraud reigns throughout the British public Commissariat.

'It remains to be seen whether the Government is able and willing to take steps to stay this gigantic evil and national dishonour. Mr. Scholefield has, we see, given notice of a motion for the appointment of a Committee of Inquiry into this long-standing and organized system of public robbery. . . .'—The *Quarterly Review*, March, 1855.

'Some thirty years ago the British public was frightened by the cry of "Death in the pot"; but we might now, it seems, re-echo the alarm with greater force than ever. Death is not only in the pot, it is everywhere; not only in our food and our drink, but in the very medicines which should cure our diseases. The matter is now under investigation before a Parliamentary Committee, and it has been shown by evidence of the most convincing kind that of the articles of daily use and first necessity a very great portion is subject to foul and systematic adulteration.

'But how, the reader may ask, has the discovery at this particular period been made or certified? Partly through material improvements effected in the means of detection, but mainly by the skill and perseverance of Dr. Hassall, who, by devoting to this subject the energies of a scientific mind, and pursuing it with that steady zeal which its importance justified, has thus become a public benefactor of no common order. If gratitude is due to those who discover antidotes to disease, or invent appliances for relieving pain, the same obligation must undoubtedly be admitted to the man whose researches, by detecting the hidden seeds of sick-

ness, must directly tend to prolong life and increase its comforts.

'The facts of the case, though already more or less known to the public, are really startling when presented in so large a mass and on such formal authority. "In *nearly all* articles," said Dr. Hassall before the Committee, "whether food, drink, or drugs, my opinion is that adulteration prevails. . . ."

'. . . Dr. Hassall expressly deposed that he "had not observed any great difference in the samples procured from wealthy or the poorer neighbourhoods." We only trust that such services as Dr. Hassall has rendered in the matter will not be soon forgotten.'—The *Times* (leading article), July 24, 1855.

'We think Dr. Hassall is deserving of much praise for the patient labour, skill, and ability displayed. Dr. Hassall's work abounds in the most useful information for all classes of the public, whether professional or not. Such a work should be taken up by the country; a condensation of it reprinted for general cheap circulation, and its author placed by the Government in such an independent position as to enable him to carry out, with the sanction of Parliamentary authority, inquiries here only commenced.'—The *Dublin Quarterly Journal of Medical Science*, 1855, xix. 442 : review of 'Food and Its Adulterations,' 1855.

'It is the great and original merit of Dr. Hassall to have applied the microscope to important uses in inquiries of this nature, and to have shown by its uses not only many things previously considered impossible to show, but many things not previously suspected to exist. . . . Dr. Hassall has shown, by an immense accumulation of facts, that it is almost impossible, by any process available in commerce, so to alter the characteristic integral physical forms of organic tissues as to prevent their being rapidly recognized by the microscope. . . .

'Dr. Hassall, then, has, by methods hitherto com-

paratively unpractised, succeeded in the task of unfolding the mysteries of adulteration. He has enabled every one to avoid that which is prejudicial to health, and to obtain that which is pure and beneficial. . . .

'The Legislature is now, through the labours of Dr. Hassall, put in possession of the sure and inexpensive means of effecting the most important savings.

'To have accomplished two objects of such magnitude and of such universal interest, is, it must be admitted, no slight claim to praise. . . . Indeed, the last and most conclusive evidence of the importance of the revelations contained in Dr. Hassall's book, is the fact that extensive reforms in the laws relating to food, directly flowing from his researches, are already agitated in Parliament.'—The *Lancet*, 1855, i. 98: review of Dr. Hassall's 'Food and Its Adulterations,' 1855.

'It is now many years since Accum published his celebrated "Death in the Pot" treatise, and since then the subject has been attended to by Mitchell, Normandy, and others. But the writings of these gentlemen have made little public impression, one reason probably being that the existing state of our knowledge at the time did not in all cases enable them to make their statements sufficiently exact and precise. Some four years ago Dr. Hassall, who, besides the more ordinary studies of a physician, has paid particular attention to microscopical investigations, had his attention turned to ground coffee as sold in the shops, and he read the result of his investigations upon this article made by means of the microscope to the London Botanical Society, and his paper excited considerable attention. This led him to consider the state of sugar, as sold in our shops; but while he was doing this he was applied to by Mr. Wakley, as proprietor of the *Lancet*, to investigate the actual state of articles of food in general as usually found in the shops, and (at least, eventually) if he found any particular sample adulterated, to publish the name of the vendor, with the particular nature and extent of the adulteration,

Mr. Wakley taking all the responsibility of such publication. Accordingly Dr. Hassall has already investigated nearly fifty articles of food, or classes of articles of food, and has discovered an amount of adulteration which certainly no person was prepared for. Only one or two dealers, the purity of whose goods has been denied, have attempted to defend themselves, or to explain away their proceedings, and every one who has so attempted has completely failed. The secret of his success has been that, in addition to chemical analysis, he has used the microscope in his inquiries, and his merit not only consists in the able manner in which he has employed the instrument, but in his being the first to use it practically, and to such an extent, for the purpose. Before giving an abstract of some of the results that he obtained, we may cite as an example of the almost infallible accuracy to which he has attained the following fact. . . .

'That is to say, that Dr. Hassall detected, by means of the microscope, one part of turmeric in 547 of mustard. . . . In fact, as there is no simple element, the existence of which cannot be detected by means of chemistry, and its nature ascertained, so there is no compound article of food that cannot have *its* nature determined by means of the microscope. For the future, then, any adulteration of an article of food may be in one of these two manners easily detected, and for the latter of these two methods of detection we are practically, as before mentioned, much indebted to Dr. Hassall.'—*Dublin Review*, 1855, xxxix. 60: review of 'Food and Its Adulterations,' 1855.

'We are not aware that so complete a work on the adulteration of food has been published in any language as the one now before us. The labour which has been given to its production must have been excessive. To analyze such a work is impossible; and we must satisfy ourselves with directing the attention of our readers to it, and with assuring them that the information contained in it should be familiar to every medical practitioner.

'The Adulteration of Food is one of the most important subjects which can be considered by any Government; and various have been the proposed schemes for preventing or limiting this most hurtful practice. The author proposes that a Central Board, with analytical chemists attached to it, whose duty it should be to look out and detect adulteration in wholesale and retail practice, and to bring the offenders under the penalty of the law, should be instituted. Some such plan as this we believe indispensable.'—The *British and Foreign Medico-Chirurgical Review*, 1855, xv. 468: review of 'Food and Its Adulterations,' 1855.

'Since Accum's "Death in the Pot," no book on the adulteration of food in this country has created the sensation which the one now before us has done. As an important branch of the sanitary subject, which all the civilized nations of the West have now fairly engaged in, this one of the adulteration of food is most worthy of public consideration; and as in the chief articles of plain diet the adulterations are easily detected, while they are inflicting incalculable evil upon the people of this country, and especially upon that essential portion of them (the working men) least able to protect themselves, it is clearly the interest of every patriotic and the duty of every humane man to give some attention to the topic. We say that a deep and solemn responsibility rests upon every Christian man in reference to this great subject of public health, whereof the adulteration of food is one, and the pollution of the air and water of the people is another grand section; and we say further, that as the poor are, in the present state of their knowledge and political influence, absolutely helpless to remedy the evils complained of, a tenfold responsibility rests upon those who do possess the intelligence necessary to discern, and the political power to remedy, these evils. . . . This book of Dr. Hassall's will be—has, indeed, already been—of effectual service in attracting the attention of the public to the important reform

under consideration. We remember well, in 1850, when the first of these analytical papers appeared in the *Lancet*, what consternation was excited in the tradesmen of the Metropolis on their finding their *names* given along with analyses of goods procured at their shops; and how, strong in the veracity of the microscope and the laws of chemical affinity, the editor of that paper laughed at their threats of prosecution and all the outcry which they raised. . . . In America measures have been successfully adopted to arrest adulteration in food; thus showing that it is not popular liberty which prevents reforms like these. Dr. Hassall and his staff went on for four years giving analyses of various articles—arrowroot, coffee, tea, bread, vinegar, pepper, cocoa, tobacco, bitter beer, etc., giving the names of both the knaves and the true men—helping the latter, no doubt, largely; setting the former at defiance, and conducing much, for the time, to prevent the practice of adulteration. He gave also full explanations of the methods of analysis, and drawings of the microscopic appearances of both the true and the adulterated articles. The whole of these are now collated in the work under notice. . . . And so, now, after France, Prussia, and America have led the way, and after Accum's "Death in the Pot" has been proverbial for a generation, and Dr. Hassall's analyses of "Food and Its Adulterations" have been going on for five years, we have, at last, John Bull roused; and after having remonstrated at Birmingham, Manchester, and elsewhere, in public meetings, during the last year, we have Members of Parliament alluding to this book, and founding on its revelations a measure for the remedy of the evils of which it treats. . . . The reputation of a common huckster of the back-streets is blasted by the discovery of false weights and measures: no respectable tradesman, except by an accident, is found guilty of possessing them; we believe the time will come when, in the essential articles of the people's diet, adulteration will be as rare and as easily detected

as these formerly common frauds of unjust measures and weights. Dr. Hassall's book will hasten that time.' —The *Eclectic Review*, N.S., November, 1855, x. 576: review of 'Food and Its Adulterations.'

'The book before us is the record of an enormous amount of painstaking labour.'—*Association Medical Journal*, N.S., 1855, iii. 157: review of 'Food and Its Adulterations,' 1855.

During the progress of this great undertaking, Dr. Hassall's marvellous energy carried all before it. Although he was entitled by the terms of the agreement to avail himself of outside assistance when he thought it necessary,[1] and did so in a few instances—in a small fraction only of the purely chemical part of the work, he alone made considerably over 2,300 of a total of nearly 2,500 analyses, microscopical and chemical, or about fifteen-sixteenths of the whole; besides collating results, drawing up the reports, planning their order and arrangement, and attending in person at the purchase of the samples, in various neighbourhoods and in all weathers. In fact, the entire conduct of the 'Commission' was entrusted to him, from buying samples to the final correction of the proof-sheets. He was *the* Commissioner, and the very life and soul of the Commission.

That some outside assistance was received has been indicated. This was duly mentioned in the reports, and suitably acknowledged on their republication.[2] But so important

[1] 'I confided the whole to Dr. Hassall, who was empowered to obtain such assistance as he might require.'—Mr. T. Wakley's evidence before the Parliamentary Select Committee to inquire into the Adulteration of Food, Drinks, and Drugs, 1855-56.

Mr. Wakley's answer to Question 2,248 ('Do you know how many he employed?'): 'No, but he consulted every now and then men of distinguished attainments, and he had the assistance in the chemical department, to a considerable extent, of a very distinguished man, Dr. Letheby.'

[2] 'We have now to acknowledge the great assistance which we have derived at different times from our friend Dr. Letheby, to whom we have been in the habit of referring frequently on doubtful points. The chemical portions of the later Reports contained in this volume, commencing with that on "Vinegar and its Adulterations," have all been revised by Dr. Letheby. Our best thanks are, therefore, due, and most cheerfully accorded, to that gentleman for the kind and ready aid which he has at all times afforded us.'—'Food and its Adulterations,' Introduction, p. xl.

were the disclosures that, as often happens in similar cases, disagreement and heart-burning arose as to the apportionment of the credit. The leading daily journal rightly, and not unnaturally, assigned most of it to Hassall, who had done the lion's share of the actual work.[1] A substantial mark of appreciation, in the form of a public testimonial to him, was known to be in contemplation; and advantage was taken of so tempting an opportunity, to make a discreditable attempt, as foolish in its inception as it was unscrupulous in method, to depreciate Hassall's work by magnifying the amount of aid that he received.[2] The gentleman who assisted him, and had

[1] The *Times*, July 24, 1855, *loc. cit.*

[2] In connection with this matter, the following comments appeared in the *Morning Post*, the *Association Medical Journal* (afterwards the *British Medical Journal*), and the *Picture Times:*

'Everybody remembers how great was the commotion when the so-called Sanitary Commission of the *Lancet* began its labours, detecting adulterations and publishing the names of the vendors, if not the manufacturers, of adulterated articles. . . . The labour of discovering the adulterations disclosed through the pages of the *Lancet* devolved on Dr. Hassall. All the microscopic experiments were performed by him, and most of the chemical ones. That another gentleman was employed by Dr. Hassall to conduct a few of the chemical investigations does not furnish grounds of a claim to participation in the credit of the original idea. It is right to express this opinion at once, because attempts not at all creditable have been made to deprive Dr. Hassall of a portion of the merit which belongs to him as an original investigator. Undoubtedly this gentleman was the first who called attention to the powers of the microscope in discriminating between the presence of solid extraneous bodies in articles of food, drink, and medicine. Before his time the microscope had been employed to distinguish between the forms of starch globules from various sources—to discover the presence of cantharides, and a few parallel applications; but until the labours of Dr. Hassall no general application of the microscope had ever been made to the discovery of extraneous bodies generally in articles of food, drink, and medicine. Whatever of credit belongs to this branch of investigation we unhesitatingly award to Dr. Hassall. Up to his time the microscope had been neglected in these sort of investigations more than it should, and chemistry was put to do things which ought never to have been expected of it. . . .'—*Morning Post*, April 8, 1857: review of Dr. Hassall's 'Adulterations Detected,' 1857.

'In mentioning the name of Dr. Hassall as an analyst, however, we do not wish merely to associate his name with those of many able men who have travelled the same path as himself. Had he been no more than his predecessors, we should only have accorded him the same amount of praise as is due to all faithful labourers in a public cause. In our opinion, however, he stands out from his fellows, from the fact that he has

been his personal friend, *punicâ fide* sent letters to the press, endeavouring to appropriate the credit for most of the scientific part of the work; published extracts from Dr. Hassall's private letters, carefully selected for the purpose of damaging his case; and wrote articles in which he used matter from his book without acknowledgment, and imitated his title.[1] Almost simultaneously there appeared in several journals paragraphs, written with extreme bias and for the obvious purpose of injuring to the utmost Hassall's claims

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furnished a new weapon to the hand of the scientific man in combating villainy.

'In applying the microscope in order to discover the ultimate structures of articles of food, etc., he has brought a new sense to bear upon fraud, and enabled the analyst to do his work with speed and simplicity, instead of laboriously—and in some cases uncertainly—by the unaided powers of chemistry.

'. . . Some little time since an attempt was made—an unworthy one, we think—to depreciate his labours, and, indeed, to deny that the main credit of the *Lancet* Commission was due to him. That attempt failed, and deservedly so; and as the opposition of Mr. Wakley is now spoken of by that gentleman as only "a lovers' quarrel," perhaps Dr. Hassall will do best to forget the passing cloud which at one time threatened to prove the only reward of his labours. The beautiful testimonial presented to him at the Freemasons' Tavern on the 13th by a number of medical admirers and others must be felt as a compliment to the profession of which he has proved himself a distinguished member.'—*Association Medical Journal* (afterwards the *British Medical Journal*), 1856, p. 425: article, 'The Testimonial to Dr. Hassall.'

'For the great and noble services rendered by Dr. Hassall in the exposure of the adulterations of articles of food his friends believed that he deserved a public testimonal, and steps were taken towards the accomplishment of this object. No sooner, however, was the project set afoot than up started a few envious persons, who unblushingly laid claim to the merit of the good work. . . . No sooner had Dr. Hassall given his evidence before the Parliamentary Committee, and the testimonial been announced, than . . .; so that Dr. Hassall, who wrote and prepared every one of those papers printed from time to time in the columns of the *Lancet*, and in the course of his labours made the large number of 2,585 analyses of various articles of food, is to be shelved. . . . Here . . . was a case of gross injustice sought to be palmed upon the judgment of the public. . . . Dr. Hassall has . . . felt himself called upon to publish a pamphlet, giving an account of the whole transaction, . . . which disproves in every particular the share of the honour attempted to be set up, and, in our opinion, places the conduct of Dr. Letheby in no very enviable light.'—*Picture Times*, February 23, 1856.

[1] *Vide* the *Home Companion*, October 1, 1855.

to public gratitude.[1] This attempt signally failed, as such attempts deserve to do; and, indeed, was effectually and promptly quashed by the publication of accounts, compiled from the receipts for the payments made to the gentleman for such assistance, showing the exact amount and nature of the extraneous help received by Dr. Hassall, and its relatively insignificant extent.[2] The editor of the *Lancet* perceived, and ungrudgingly admitted, by his presence and his speech at the presentation of the public testimonial to Dr. Hassall,[3] that the latter's claims were undeniable.

It may be added that Dr. Hassall continued to be a regular and valued contributor to the *Lancet* of signed and unsigned articles, reports, and analyses for upwards of thirty years longer.

Already I have shown that, prior to 1850, for the particular purpose of the detection of the adulterations of food and drugs, the microscope had been almost absolutely neglected; and a notable feature in these reports was the very great prominence given to the use of this instrument. Though by no means entirely so, Dr. Hassall's most valuable and novel results were in great part obtained by its aid, a circumstance to which he himself was foremost in drawing attention. It was, in fact, the microscope which had by far the larger share in the exposure of the frauds then practised. But the accompanying chemical work must have been exceedingly well and carefully performed, seeing that, of the very large number of analyses made, not more than one or two were seriously challenged; and although a few lawyers'

[1] It is noteworthy that from beginning to end of the article, 'Adulteration,' in the 'Encyclopædia Britannica,' ninth edition, written some years later (1875) by Dr. Henry Letheby, there is *not one mention of Dr. Hassall's name.* There *is*, however, a reference to Dr. Letheby himself.

[2] See Appendix A, ii., footnote, p. 92.

[3] 'Mr. Wakley . . . said he had for once enjoyed "unadulterated" pleasure; and he took occasion to express his regret at the temporary estrangement between himself and Dr. Hassall, which he said was "a mere lovers' quarrel." He further said that he had attended the festival for the express purpose of bearing his testimony to Dr. Hassall's inflexible integrity and brilliant abilities, assuring him that his slanderers should not assail him unjustly.'—The *Times*, May 16, 1856; the *Lancet*, 1856, i. 562; and *Pharmaceutical Journal and Transactions*, 1856, xv. 531 (accounts of the presentation of the public testimonial to Dr. Hassall). For full reports of this function, see Appendix C.

letters were received, in no single case did the vendors of the adulterated articles successfully proceed against the editor of the *Lancet*.[1] This is the more to Hassall's credit, because his results were obtained at least a quarter of a century before the immense improvements in food analysis of the past few years were dreamed of. It is no disparagement to Dr. Hassall to say—as some have—that he was more of a physician and microscopist than an analytical chemist. Many another analyst has begun his professional career as a medical man; and Hassall undoubtedly had to gain his special knowledge and graft it on to a medical stem. Having regard to the enormous development of analytical chemistry during the past thirty years, he was not, perhaps, at any time a scientific chemist in the present sense of the term. Analysis was an incident of his life, as has been before remarked. To the end, he was, in accordance with his own personal preference, physician first, microscopist and analyst afterwards.[2] Nevertheless, at the time of which I write, although there were professors of chemistry and practising analysts, somehow not one of them had managed to do what Hassall achieved, in spite of the supposed disadvantage of his medical training. And whatever may have been contemplated or planned by the editor of the *Lancet* or others, during the twenty years, 1830-50, was only at last accomplished by the tremendous energy and vigorous application of Dr. Hassall. To judge by the results of his labours, in discovering the adulterations of food in 1850-54, Dr. Hassall was a *far-and-away more successful analyst than any of his contemporaries*. It is certain that nearly all that analysts now know of the microscopy of food was taught them by him,[3] and so completely that for fifty years little has been added to this part of our knowledge bearing on the discovery

[1] There was only one case in which any really serious proceedings were adopted, and these were dropped.—Evidence of Dr. Hassall before the Parliamentary Select Committee on Public-Houses, 1854, Mr. C. P. Villiers in the chair.

[2] In his 'Autobiography' he remarks (p. 58): '. . . I scarcely regarded myself as a permanent and professional analyst. I became one rather by accident than design, my profession always having been that of medicine.'

[3] The microscope he used, which came into the possession of the writer, may be considered to have an historic interest.

of the adulterations of food.[1] Several latter-day food microscopists, especially abroad, have published works characterized by great wealth of botanical detail, but comparatively few have been the essential additaments to the edifice set up by Hassall. What there was to be done, he did so well and thoroughly, that the results must ever redound to his honour, and testify to his remarkable ability, and accuracy of observation. Before the appearance of the Reports, written in 1851-54, of which his 'Food and its Adulterations,' published in 1855, was a reprint, no book existed in which were given minute descriptions, with plates, of the various microscopic structures of all the chief foodstuffs, as well as of the substances used to adulterate them. And Hassall's clear and concise descriptions, coupled with the equally accurate and practically useful delineations, yet remain, in the opinion of the present writer, among the best and most complete of their kind.

A further work, in which these and other plates appeared, was entitled 'Adulterations Detected,' and was published in 1857. This book had a large sale, and went to a second edition in 1861. Lastly, in 1876, Dr. Hassall produced 'Food: Its Adulterations and the Methods for their Detection,' a larger work, in which details of later chemical processes accompanied the sections devoted to familiar operations and microscopical analysis. For the last-named book, though it has been out of print for some time, there is now inquiry and demand.[2]

[1] 'To him public analysts owe most of their knowledge of the microscopic structure of food substances. He was truly the father of public analysis.'—The *Analyst*, May, 1894.

[2] Dr. Hassall's several works on food and adulteration were most favourably—indeed, enthusiastically—reviewed. See, *inter alia*, the following: The *Lancet*, 1855, i. 98*; 1857, i. 119 (A[2]); 1861, ii. 502 (A[5]); 1876, i. 133 (A[23]). The *Association Medical Journal*, N.S., 1855, p. 157*; May 9, 1857. The *Quarterly Review*, March, 1855.* The *Dublin Quarterly Journal of Medical Science*, 1855, xix. 442.* The *Dublin Review*, 1855, xxxix. 60*; 1857, xlii. 534 (B[3]). The *Eclectic Review*, N.S. (November, 1855), x. 576.* The *British and Foreign Medico-Chirurgical Review*, 1855, xv. 468.* The *Athenæum*, June 30, 1855; February 28, 1857 (B[4]). The *Morning Post*, April 8, 1857.* The *Scotch Thistle*, June 27, 1857 (B[5]). The *Leader*, January 31, 1857. The *Atlas*, April 24, 1857.

[Reviews marked * have been already quoted: extracts from those marked (A) and (B) will be found in Appendices A and B.]

In September, 1855, Dr. Hassall, who was a member of the Committee of the Chemical Section, read a paper in Glasgow at the twenty-fifth meeting of the British Association for the Advancement of Science, 'On the Chemistry of the Adulteration of Food.'[1] In January of the following year he read before the Pharmaceutical Society an important paper, which gave rise to much discussion, 'On the Adulteration of Annatto';[2] and a few months later, before the Medical Society of London, a paper on 'The Adulteration of Liquorice.'[3]

He next turned his attention to the 'Bread of Edinburgh' and the 'Oatmeal of Edinborough,' on which reports by him appeared in the *North Briton* of May, June, and July, 1857.[4] The samples examined were remarkably satisfactory. Not one was found adulterated. Dr. Hassall's reports in the *Lancet*, and their subsequent republication, had already begun the work of reform.

An article from Dr. Hassall's pen on 'Adulteration and its Remedy,' appeared in the *Cornhill* for July, 1860; and from November, 1871, to November, 1874, he edited a journal, *Food, Water, and Air*, founded by himself.

The initial result of the disclosures in Dr. Hassall's four years' reports, was a meeting, convened on December 11, 1854, by Mr. J. Postgate, F.R.C.S., of Birmingham, urging the attention of the Legislature to the subject of the adulteration of food. The next was the appointment, on June 16, 1855, of a Parliamentary Select Committee, under the presidency of Mr. W. Scholefield, M.P., before which Dr. Hassall was the chief scientific witness.[5] The third result was the

The *Sun*, January 27, 1857. The *Mark Lane Express*, March 16, 1857. The *Economist*, March 7, 1857. The *Midland Counties Herald*, January 29, 1857. The *Liverpool Courier*, February 26, 1861. The *Glasgow Daily Herald*, February 14, 1861. The *Birmingham Journal*, April 27, 1861; and the *Practitioner*, cxi., September, 1877.

[1] *North British Daily Mail*, September 18, 1855.

[2] *Pharm. Journ. and Transactions*, January, 1856.

[3] The *Lancet*, 1856, i. 458.

[4] *North Briton*, May-July, 1857.

[5] He also gave evidence, in 1854, before the Select Committee on Public-Houses, of which Mr. C. P. Villiers, M.P., was chairman, and before the Committee (of 1874) on the Adulteration of Food Act (1872), presided over by Mr. Clare Sewell Read, M.P.

passing of the first general Adulteration Act, of August 6, 1860 ('An Act for Preventing the Adulteration of Articles of Food or Drink'), the forerunner of the Act of 1872, which led to the appointment of public analysts for the various counties and boroughs.

Among the recommendations in Dr. Hassall's evidence; in 'Food and its Adulterations'; and in 'Adulterations Detected,' were the appointment, in the principal towns and districts of the United Kingdom, of inspectors and analysts, to be vested in the municipal or other local authorities, the same analyst perhaps acting for several towns;[1] the establishment by the Government of a Central Board or Commission, on which there should be a sufficient number of scientific analysts, microscopical and chemical, entrusted with powers to deal with the adulteration of the food and medicine of the Metropolis and its suburbs; periodical returns to be published by the Central Board, and to be furnished by local analysts to that Board; names and addresses, of ALL vendors of articles analysed, to be published, whether the samples were genuine or adulterated; the services of sanitary inspectors to be utilized to some extent in procuring articles of food and medicine; sellers of adulterated samples to be punished by fines, the actual adulterator by fine or imprisonment, the latter for second offences; persons convicted of selling adulterated goods were to keep a placard containing the text of the judgment condemning them posted up in the most prominent part of their windows for three, six, nine, or twelve months at a time; and, lastly, examining inspectors were to be appointed in import and export towns, to prohibit the importation or exportation of adulterated articles, including drugs.

At a later date (*Lancet*, 1873, i. 882, 883), Dr. Hassall drew up a list of additional recommendations, of which the following were the more important:

[1] *Cf.* Dr. Thurnall, in chapter i. of the Rev. Charles Kingsley's 'Two Years Ago,' written in 1856: '. . . Till we have, as we ought to have, a first-rate analytical chemist settled in every county town, and paid, in part at least, out of the county rates.'

That the Act of Parliament should contain clauses defining exactly what is embraced under the term 'adulteration':

That a distinction should be made between certain sophistications notoriously of *foreign* origin (such as the small quantities of copper in pease and beans imported from France), and other adulterations:

That inspectors should have the power to enter all wholesale manufacturing establishments, for the purpose of obtaining samples for analysis:

That spirits sold to consumers should contain not less than a certain percentage of alcohol;

And that as the faces of the inspectors in some neighbourhoods might be known, two trustworthy unknown persons, one acting as a witness, should be empowered to purchase samples; then labelling the bottles, etc., before entering another shop.

It is common knowledge that many of these wise suggestions have been adopted: but much, unfortunately, remains to be done.

In the year 1874, a Select Committee was appointed to inquire into the working of the Act of 1872. Dr. Hassall gave evidence before the Committee, on the report of which was based the Sale of Food and Drugs Act, 1875. This was followed successively by the Amendment Act of 1879, the Margarine Act, 1887,[1] and, ultimately, by the latest Food Adulteration Act, that now in force, 62 and 63 Victoria, ch. 51, dated 1899. Perhaps the most important consequence of the exposures, and resulting agitation, was a very great decrease, which became everywhere observable, in the grosser forms of adulteration. Lastly, in 1874, the foundation of the Society of Public Analysts, directly traceable to Dr. Hassall's investigations, gave an impetus to the study of those especial branches of chemical science which are grouped together under the name of food analysis, and inaugurated a new department of scientific literature.

Thus, after about a quarter of a century, was consummated an important reform, in which no man had a larger share

[1] Also the Merchandise Marks Act, 1887.

than Arthur Hill Hassall. And nowhere was his great part in the work more unreservedly admitted than in the columns of the *Lancet*. During many years articles appeared in that journal, extolling or referring appreciatively to Hassall's services.[1] Extracts will be found in Appendix A, and one short article is quoted below almost *in extenso*:

'ADULTERATION OF FOOD AND DRUGS.[2]

'In the face of a statement recently published by a lay contemporary respecting the initiation of the movement that led to the passing of the Adulteration Act, we deem it proper to record the following facts. Thirty years since the *Lancet* systematically re-entered upon a labour, first begun in the year 1831, of calling the attention of the profession, the public, and the legislature to the subject of adulteration. About the year 1851 Dr. Arthur Hill Hassall took up the work, and prosecuted it with vigour, applying to its detection and discovery all the resources of science, including more particularly the microscope. His researches at once attracted marked attention, and led to a conference between the late Mr. Wakley and himself, the result being the establishment of the ANALYTICAL SANITARY COMMISSION. The first of the reports of this Commission appeared in the *Lancet* of January 4, 1851. For a long time the reports were published each week, and afterwards fortnightly or at wider intervals, for a series of years. They . . . gave the names and addresses in full of the various merchants, traders, and others from whom the articles had been purchased, whether they

[1] See the *Lancet*, 1854, ii. 151, 152; 1855, i. 98; 1856, i. 76 (A^1); 1856, ii. 227, 310; 1857, i. 119 (A^2), 467; ii. 60; 1860, ii. 272 (A^3); 1861, i. 323 (A^4); ii. 501 (A^5); 1864, ii. 276 (A^6); 1866, ii. 499 (A^7); 1867, i. 673 (A^8); 1869, i. 96 (A^9), 369 (A^{10}); 1871, i. 354 (A^{11}); 1872, ii. 652 (A^{12}); 1873, i. 882 (A^{16}); 1874, i. 842 (A^{17}), 918 (A^{18}); 1874, ii. 132 (A^{19}), 202 (A^{20}); 1875, i. 275 (A^{21}); 1876, i. 133 (A^{23}); 1881, ii. 638 (quoted above); 1886, ii. 465 (A^{24}).

(*Vide* Appendix A for extracts from such of these articles as have not been quoted elsewhere.)

[2] The *Lancet*, 1881, vol. ii., p. 638.

were found to be genuine or adulterated. . . . The idea of publishing in all cases the names and addresses of the parties originated entirely with Mr. Wakley. . . . In the course of the Reports the names and addresses of nearly 3,000 persons were published; . . . and this, remarkable to say, without a successful action being sustained in any one case against the *Lancet*—a convincing proof of the accuracy of the Reports. DURING THE WHOLE OF THIS TIME DR. HASSALL WAS THE HEAD AND PRIME MOVER IN THIS COMMISSION. IT WAS HE WHO, ACCOMPANIED BY HIS WITNESSES, PURCHASED THE SAMPLES, EXAMINED AND ANALYZED THE VAST MAJORITY OF THEM, AND WROTE THE WHOLE OF THE REPORTS, subject only to the approval and revision of Mr. Wakley, who was at the cost of the Commission, and who, it should be stated, never on any one occasion intervened with a view to add or detract from the severity of the exposures or to screen any offender. The Reports of this Commission attracted universal attention: they were not only quoted throughout the length and breadth of the land, but extracts from them found their way into all the leading foreign journals. They resulted in the disclosure of a widespread and most dangerous system of adulteration. THROUGH THEIR INSTRUMENTALITY PUBLIC OPINION BECAME THOROUGHLY AROUSED, AND SO STRONG A CASE WAS ESTABLISHED THAT PARLIAMENTARY INQUIRY WITH A VIEW TO LEGISLATION BECAME IMPERATIVE. We are very proud of the part which this journal took in this great and important question, and although the services thus rendered to the profession and the public have been over and over again freely and publicly acknowledged, years have since passed, and with the lapse of time many things are apt to be forgotten, and this would even seem to be the case with respect to the events of which we are now writing. In the obituary notice of the late Mr. Postgate, which appeared in the *Times* of October 1,[1] the follow-

[1] The date was September 30, 1881.

ing sentence occurs: "Indeed, it is not too much to say that it is primarily to the scientific skill and benevolent zeal of Mr. Postgate that we owe the existing laws against the adulteration of food and drugs. It was in January, 1854, that Mr. Postgate first commenced his crusade against this evil in a letter to the late Mr. Scho[le]field," etc. The claim thus made is one which cannot be sustained. The scientific work of the detection and exposure of adulteration, as set forth in the Reports, was commenced in the *Lancet* three years before the date on which the claim of Mr. Postgate is stated to have been founded. Of the first Parliamentary Committee, which sat in 1855, to inquire into the subject of adulteration, DR. HASSALL WAS THE CHIEF ADVISER, AS ALSO THE PRINCIPAL WITNESS, the *Lancet* reports furnishing the basis and groundwork of the Committee's inquiries. Such, stated in as few words as possible, are the actual facts and circumstances, and it was therefore impossible for us to allow the claim advanced on behalf of Mr. Postgate to pass unnoticed. Mr. Postgate, no doubt, used his influence at an advanced period of the inquiry with Mr. Scho[le]field in furtherance of useful legislation, and thus far he is entitled to credit and praise.'—*Lancet*, 1881, vol. ii., p. 638.[1]

With some of his coadjutors in the crusade against adulteration, Dr. Hassall at one time had to bear much unmerited abuse and obloquy, arising in some quarters from a desire to maintain the *status quo ante*, and in others from motives of rivalry and jealousy, etc. It will have been gathered, moreover, that efforts were not wanting to appropriate the credit due to him.[2] But he 'stuck to his guns,' and for at least thirty-eight years had the satisfaction to know that his claims were admitted, and that his work was generally acknowledged to have been the leading factor in

[1] The capitals in this extract are inserted by the writer of the present memoir.

[2] See *ante*, pp. 26, 27.

the exposure of the shameful adulteration which prevailed in the early 'fifties.[1]

These facts were fully recognized in all the obituary notices[2] of Dr. Hassall, with one exception, which one read with painful surprise. Neither Dr. Hassall, nor his friends for him, made 'extravagant claims.' Before the author are the *ipsissima verba* of the circular letter[3] to the public, setting forth Hassall's services, and inviting subscriptions for a

[1] 'The greatest service which had been done the country in connection with the subject was that which had been rendered by the Analytical Commission which prosecuted its labours some fourteen or fifteen years ago under the able direction of Dr. Hassall, the result of whose investigations had been published in the *Lancet*.'—Speech of Mr. Pochin, M.P., in the House of Commons, March 5, 1869, 'Hansard's Parliamentary Debates,' 1869, cxciv. 729.

'The dangerous and poisonous mixtures to which Dr. Hassall originally drew attention are now practically things of the past.'—*Brit. Med. Journ.*, 1883, ii. 788.

'Nearly half a century has elapsed since Dr. Arthur Hill Hassall, in his classical works on the detection of adulterations in food and medicine, strongly advocated the use of the microscope as a valuable aid to chemical analysis in the examination of a large variety of vegetable substances, an advocacy that he supported by the publication of a great number of analyses.' —Preface, 'The Microscopical Examination of Foods and Drugs,' by Professor H. G. Greenish, 1903.

See also 'Report of the Select Committee on Adulteration,' 1856 (B^1); the *Times*, March 3, 1856, leading article (B^2); *Pharmaceutical Journal and Transactions*, 1857, xvi. 185 (B^6); the *Scotch Thistle*, June 27, 1857; *Westminster Review*, 1869, p. 186, referring to Dr. Hassall's book, 'Food and its Adulterations' (B^7); *ibid.*, 1888, p. 24 (article, 'Adulteration of Food and the Remedy') (B^8); *Daily Telegraph*, July 22, 1891 (B^9), leading article; the *Chemist and Druggist*, October 28, 1893 (B^{10}); *Dublin Journal of Medical Science*, 1894, xcvii. 257-260, Review of Hassall's 'The Narrative of a Busy Life' (B^{11}); *Notes and Queries*, 9th S., July 20, 1901, viii. 59 (B^{16}); A. Wynter Blyth's 'Foods: their Composition and Analysis,' fourth edition, 1896 (already quoted); the 'Harmsworth Encyclopædia,' 1905, iv., biographical note (B^{17})

(For extracts from these marked B, *vide* Appendix B.)

[2] Obituaries: the *British Medical Journal*, April 14, 1894; *Nature*, August 19, 1894 (B^{12}); the *Journal of Botany*, xxxii. (1894), pp. 190-1; the *Medical Press and Circular*, April 11 and 18, 1894; the *Hospital*, July 28, 1894; *Food and Sanitation*, July 28, 1894; the *Chemical Trade Journal*, January 19, 1895 (B^{15}); *Health*, August 17, 1894; the *Analyst*, May, 1894 (B^{13}); the *Queen*, August 11, 1894; the *Sun*, July 18, 1894; *Il Pensiero di Sanremo*, April 15, 1894; the *Lancet*, April 14, 1894; the *Globe*, July 18, 1894; *Daily Telegraph*, July 18, 1894; *Evening News*, July 19, 1894; *Quarterly Journal of the Royal Meteorological Society*, xx., April, 1894 (B^{14}); *Medical Times and Hospital Gazette*, April 14, 1894; *Westminster Gazette*, April 10, 1894; *St. James's Gazette*, April 10, 1894; *Guardian*, April 18, 1894; *Saturday Review*, April 14, 1894, etc.

(Passages from some of these obituaries will be found in Appendix B.)

[3] See Appendix C.

testimonial to him. The contents of the circular could scarcely be more moderately expressed, and it is clear that they received endorsement from the consensus of public and professional opinion.

The disquiet, caused by these irrefutable evidences of widespread adulteration, produced a keen demand for independent scientific corroboration of traders' statements concerning the character of their commodities; and during a period extending over many years, analysts and medical men of high professional standing—for numerous others, following Dr. Hassall, took up the subject of the nation's food—were besieged with applications for certificates as to the quality and purity of articles for popular use and consumption. Reports of the kind (which have become a regular feature of some of the more prominent medical journals, and are issued also by certain 'institutes' and 'controls' founded with the idea of safeguarding the purity of food and other products), when *bonâ fide* and written with entire honesty of purpose, are of real usefulness to the educated sections of the public, as well as to vendors and manufacturers. Several disadvantages, however, attend the conferment of such certificates. Some of the recipients continue to publish them—occasionally with the dates omitted—long after they have become obsolete: also, unfortunately, forgetting that they convey serious scientific statements, or expressions of expert opinion, sometimes in undignified or derogatory association. The expert is powerless to prevent this sort of thing, if, by an oversight, or for sheer lack of worldly acumen, in the first place he failed to lay down stringent conditions regarding the manner and period of publication.

Again, not all of those who have granted certificates have in doing so exercised carefulness and discrimination. It is undeniable that some experts, not as a rule those of long experience or the highest position, have by inadvertence too readily consented to write reports or certificates: and such testimonies sometimes have unguardedly been given to those who, it might have been foreseen, would make an indiscreet or unseemly use of them.

Many facts and circumstances within the knowledge of the author (who had exceptional opportunities, extending over many years, for observation and judgment) impel him to remark, with particularity and emphasis, that the statements in the last paragraph do not apply to Dr. Hassall. He was extremely cautious—painfully anxious—concerning the origin, nature, and intended applications of commercial products on which he was desired to certify. At one period, and in a few quarters, an impression apparently existed that the opposite was the case: an idea probably initiated and fostered—certainly not discouraged—by competing experts, who might have adopted a more fraternal attitude. It was erroneous and unjust. Every matter submitted to Dr. Hassall was carefully considered—(*a*) on its own merits, (*b*) in view of all the surrounding circumstances, and (*c*) with regard to the contemplated use of any report to be signed by himself. For every occasion on which he consented to write a certificate for publication, it is certain that there were several others when he either declined altogether, or imposed stringent conditions that the reports should be used for private information only. This the writer can affirm from personal knowledge: also that Dr. Hassall, by his scrupulosity in these difficult cases sacrificed much professional work, with, of course, contingent fees amounting to hundreds of guineas. He might have died a rich man had he chosen another course.

Dr. Hassall, owing doubtless to his pre-eminence for many years as an authority on food, suffered much from the fondness of traders for antiquated or obsolescent certificates. Even now extracts from reports written by the doctor forty years ago, and more, are occasionally to be seen, undated, and without the words, 'the late,' preceding his name: yet it is upwards of fourteen years since he died! This, of course, should not be. Dr. Hassall during his lifetime particularly objected to the continued publication of his certificates for years after they had ceased to possess any useful significance, and the same objection is felt strongly by his surviving friends and representatives. It is possible that the association in the

public mind of Dr. Hassall's name with proprietary articles of food and the like, on which at various times he was requested to report, has tended to obscure recollection and lessen appreciation of his extremely valuable services—not only in the exposure of adulteration, but as a sanitarian and publicist in many matters unconnected with the subject of food: services which it has been one of the objects of the writer of this sketch to recall, so that a due sense of proportion may be restored.

Not improbably these facts partly explain why, although, as has been stated, Dr. Hassall's claims to the gratitude of scientific men and the community usually have been and are fully admitted by *cognoscenti* and the general public, yet in a few quarters rather less than justice has been done to his memory. Disparaging remarks at his expense have not been uncommon: for instance, in a book which accidentally came into the author's hands (written by a minor official of the Inland Revenue, of all people in the world), something of the sort was manifest; and even in the *Analyst*, the organ of those, many of whom owe largely to his labours their very existence, official and professional,[1] there has been noticeable at times a tendency to 'damn with faint praise.' To describe Hassall, for instance, as 'a medical man with some skill in microscopy,' conveyed an imperfect idea of his ability and results with that instrument. He was undoubtedly one of the best microscopists of his time. And it was underrating his qualifications to assert that he knew no more chemistry than he had gained in his medical student days. During the last ten years of Dr. Hassall's life, the writer—professionally trained as a scientific chemist—was in close association with him, either personally or by correspondence, and formed the opinion (it seems an impertinence to write it) that

[1] In the year 1850 there were no analytical chemists' names in the business section of the London Post Office Directory. In 1854 there were eleven, in 1855 twenty, in 1857 twenty-four, and in 1877 the number had risen to fifty-four. At the present time, according to the Report for 1906-7 issued by the Local Government Board, in England and Wales alone there are 231 appointments of analysts for the administrative counties, county and non-county boroughs, and other public bodies.

Dr. Hassall's chemical knowledge, whenever and wherever acquired, was far greater than would be inferred from such a statement. Although, as has been indicated on a former page, he was not abreast of the most recent developments of chemical science, he was invariably full of resource, and possessed the true spirit of scientific research. It is wide of the mark to regard him as a microscopist only. His chemistry sufficed him well indeed for the time when his best work was done.

In giving a brief account of the service accomplished by him whose name heads this sketch, the writer's object is not by any means to undervalue the efforts of those associated with Dr. Hassall, or who followed him. Seldom, if ever, was a reform of the first importance begun, continued, and carried to its completion by a single man; and several other names already mentioned stand out in bold relief, notably those of Thomas Wakley, J. Postgate, and W. Scholefield. As regards the first-named, if the initial expenses and legal responsibility were his (but also by far the greater part of the immediate and substantial benefits, the *Lancet* circulation and profits having been materially increased by the agitation),[1] the *work*, most of it of a new and original kind—the δύναμις—was Hassall's. Such matters, of course, exemplify the truth of Pythagoras' maxim, ἀρχὴ δὲ τοι ἥμισυ παντὸς—the beginning is a moiety of the whole.

Mr. Postgate's part as a reformer was at a much later stage, as has been shown; in fact, not until the *Lancet* reports had been appearing regularly for nearly four years. Then, and most usefully, he called the meeting at Birmingham to which allusion has been made.

Mr. Scholefield engineered the matter in Parliament, and was a zealous and able chairman of the Committee of Inquiry, the result of which was the first Adulteration Act.

Dr. Hassall's services were publicly acknowledged on May 15, 1856, when a silver statuette, an illustration

[1] In the *Lancet* for 1852, vol. i., p. 16, the editor announced that he entered upon the twenty-ninth year of his labours 'with a larger circulation than the journal ever before enjoyed at any period of its existence.'

of which is here given, was presented to him '*in recognition of public benefits conferred by his rare scientific skill and indefatigable labour in the detection and exposure of a pernicious and systematic adulteration of Food and Drink.*' The presentation was made at a public dinner at the Freemasons' Tavern, Lord William Lennox presiding in the place of Viscount Ebrington, M.P., a subscriber, member of the Testimonial Committee, and one of the Parliamentary Committee on Adulteration, whom serious illness prevented from attending. Among the subscribers present were the Earl of Orkney, Viscount Ranelagh, Sir T. Tancred, Admiral Duntze, Mr. Montagu Chambers, M.P., Mr. Bass, M.P., Mr. Oliveira, M.P., Major Sibthorpe, M.P., Mr. T. Wakley, M.P., the editor of the *Lancet* (who testified to his approbation of the manner in which the scientific part of the work had been carried out by Dr. Hassall, and to the latter's brilliant abilities and inflexible integrity), Mr. Thwaites, President of the Metropolitan Board of Works, Dr. Waller Lewis, Dr. Farr, F.R.S., Dr. Robert Barnes, Dr. Bennet, and Dr. Forbes Winslow.[1]

A further, and official, recognition of the importance of Dr. Hassall's work was the conferment on him, in 1866, by Lord Derby of a pension from the Civil List of £100 per annum '*in consideration of his public services.*' These—in the memorial, dated August 28, 1866, praying for a pension—were stated to have been 'the Elucidation and Exposure of Adulteration in Food, Drink, and Medicine'; 'the gain to the Revenue by his labours, as also the gain to the Health of the Public'; 'the Benefits conferred thereby on the Nation'; and 'his attention to Sanitary Questions generally, especially the Water-Supply and Cholera, the exposure of the former resulting in a new and improved Supply.'

At the instance of Dr. J. Russell Reynolds, Sir Richard

[1] In Appendix C there are full contemporary accounts of the meeting at which this presentation was made, lists of the general committee, also of some of the principal subscribers to the fund, and a copy of the circular issued to the public, referred to on p. 37.

STATUETTE PRESENTED TO DR. HASSALL

On May 15, 1856, and symbolizing the discovery of adulterators' falsehoods and frauds, by a touch of the Spear of Science.

'Him thus intent Ithuriel with his spear
Touch'd lightly; for no falsehood can endure
Touch of celestial temper, but returns
Of force to its own likeness: up he starts
Discover'd and surpris'd.'

JOHN MILTON: *Paradise Lost*, Book IV.

Quain, Bart., and others, the Earl of Rosebery, while Premier, in 1894 granted the continuance to Dr. Hassall's widow of a pension of £50 per annum.

It will not escape the reader's notice that the Sovereign's Ministers, acting officially as chiefs of the Imperial Government, showed more discernment and a truer sense of proportion than did some who might have been expected to excel in warm appreciation of the subject of this memoir.

CHAPTER III

THE FOUNDATION OF THE VENTNOR HOSPITAL

'But now abideth faith, hope, love, these three; and the greatest of these is love.'—ST. PAUL: 1 Cor. xiii. 13 (R.V.).

IT now remains to refer shortly to the last great achievement of Dr. Hassall's life, and possibly the finest—namely, the foundation of the Royal National Hospital for Consumption and Diseases of the Chest at Ventnor, Isle of Wight. After his removal, in 1866, to Ventnor, whither he had gone when his health broke down in London, Dr. Hassall was struck by the circumstance that no institution for the treatment of persons suffering from consumption, and other diseases of the respiratory organs, existed in a locality so eminently suited for the alleviation and cure of this class of malady; and after much consideration he decided to devote his time and energies to the establishment of a curative hospital, for sufferers from diseases of the organs of respiration, in the highly favoured locality known as the Undercliff. He determined that the hospital should possess the following especial features, among others:—It was to be on the separate system, and to consist of blocks of semi-detached houses, each house to accommodate six patients, every patient to have a separate bedroom, while two sitting-rooms in each house were to be used in common by the six patients. All these rooms were to face due south. Secondly, every house should have a separate name, and be itself a separate hospital in miniature. Thirdly, the institution should be, in part only, self-supporting; the friends of patients contributing a portion of the funds required for admission into the hospital. Finally,

attendance at the chapel (to be erected in the centre of the range of buildings) was to be voluntary.

As the result of the issue of a prospectus, in which these and other particulars were embodied, a considerable sum of money was obtained; and many influential personages gave aid and encouragement, among them the late Lord Eversley, Governor of the Isle of Wight, Lord Monson (afterwards Viscount Oxenbridge), and the Right Hon. Sir Lawrence Peel. The first block, of two houses, was completed and opened for the reception of patients in 1868; and in 1869 the foundation-stone of the second block was laid by H.R.H. the Princess Louise, on behalf of Her late Majesty Queen Victoria. As time went on, block after block was added to the range of buildings, and in 1871-73, as the result of a special and separate appeal made by Dr. Hassall, a finely-proportioned chapel, a necessary and effective part of the design, was erected, and finished, with the exception of the spire and south cloister.[1]

Several views of the Ventnor Hospital, which give a good idea of this splendid institution, are introduced on the following pages. For permission to insert them, the author is much indebted to the Board of Management.

Before Dr. Hassall, in 1877, left Ventnor for the Riviera, having devoted ten years of his life to the establishment of the hospital, and having seen its future well assured, he was presented with a service of plate and a purse of three hundred guineas.[2] The inscription on the salver was as follows:

'*This Silver Tray, together with a Tea and Coffee Service, also a purse of three hundred guineas, were presented by a numerous body of Subscribers to Arthur Hill Hassall, M.D., in recogni-*

[1] Dr. Hassall's position as founder entailed great responsibility and much work. To his death he was Consulting Physician and a member of the Board of Management; and at one time he was a co-trustee with the Hon. C. Pelham and Mr. Stafford H. Northcote, as well as a Vice-President; a member of the general, and chairman of the local, committee; and Honorary, but acting Visiting Physician.

[2] The *Lancet*, July 15, 1876; *Brit. Med. Journ.*, 1876, ii. 149, 165, and 1877, i. 733.

GENERAL VIEW OF THE ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, VENTNOR, ISLE OF WIGHT.

tion of his valuable Services as the Originator and Founder of the Royal National Hospital for Diseases of the Chest, May, 1877.'

The treasurers of the Testimonial Fund were Viscount Eversley and the Right Hon. Sir Lawrence Peel, the Hon. Secretary being Frederick C. Colman, Esq., J.P.

Queen Victoria visited the hospital on February 11, 1888, and many other royal personages have taken an active

THE DINING HALL.

interest in and visited the institution, among them the late Prince Leopold, Duke of Albany, who was President at the time of his death. In the Ventnor Hospital, the conception and design set forth in the original prospectus,[1] drawn up by Dr. Hassall in 1867, have been literally fulfilled. The hospital has proved to be a brilliant success; the results to the patients have completely realized the expectations of the

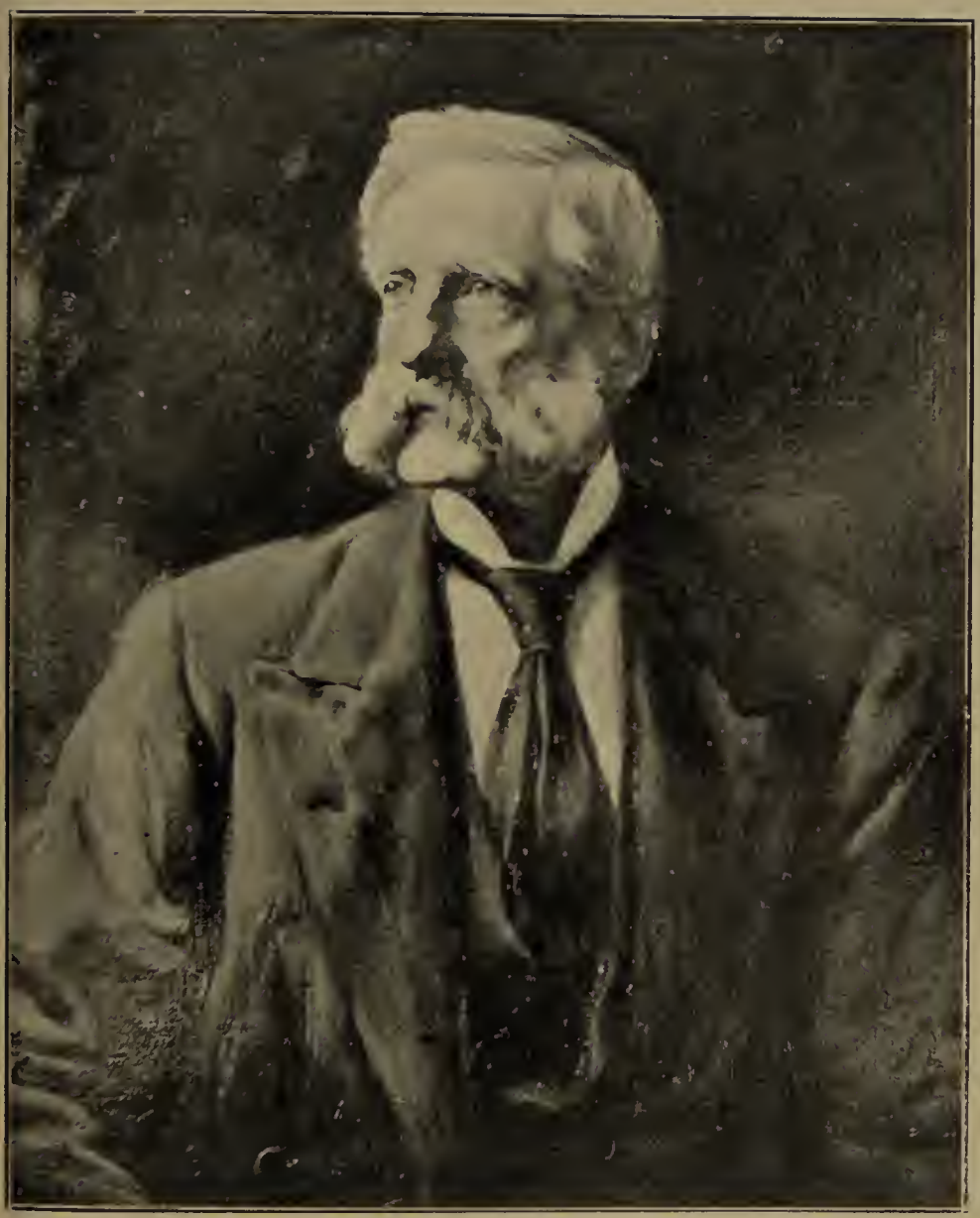
[1] See Appendix D.

THE WOMEN PATIENTS' WALKS IN THE TWENTY-TWO ACRES OF GROUNDS.

founder. Upwards of 23,000 sufferers have been benefited, with the result that, on leaving, very many have been able to resume their ordinary occupations. As the hospital is for the admission and relief of patients of all denominations, and from every part of the country, it is, in the fullest sense of the word, a national institution.

There is no space here for a detailed description of the Ventnor Hospital. It must suffice to state that the institution is in every respect a noble, useful, and enduring monument to the founder. A marble tablet on the entrance lodge records the fact of the foundation of the hospital by Dr. Hassall. A memorial portrait, painted by Mr. Lance Calkin, was, on October 15, 1894, publicly unveiled in the dining-hall by Miss Webster, sister of Sir Richard Webster, G.C.M.G., M.P. (now Lord Alverstone, the Lord Chief Justice of England), at the time Chairman of the Board of Management. Sir Richard, who presided, reviewed in a long address Dr. Hassall's remarkable career, and referred to the great results of his life-work: in particular, to those which were so patent to all present in that hall. Mr. Neale F. Horne, the Deputy-Chairman, afterwards called attention to the appropriateness of the inscription beneath the picture, '*Non omnis moriar*'; and, having alluded to the difficulties of the undertaking, carried to a successful issue by Dr. Hassall's energy and perseverance, added that his work was there—reminding them, in fact, of the well-known epitaph of Sir Christopher Wren, '*Si monumentum requiris, circumspice.*' Reports of these and other interesting speeches, as well as the names of many persons present, will be found in Appendix D. The hall was crowded by an attentive and sympathetic assemblage, composed of friends, officials (some of them old colleagues of Dr. Hassall), and many of the patients.

The Board of Management kindly permitted the author to have taken the accompanying photograph of the memorial picture; as well as the photograph, facing the title-page, of an exceedingly fine portrait, painted in 1894 by Signor Italo Sabatini, recently presented to the Hospital by Dr. Hassall's widow, and now hung in the Board Room at 34, Craven Street, Charing Cross.



THE MEMORIAL PORTRAIT OF DR. ARTHUR HILL HASSALL,

Founder of the Royal National Hospital for Consumption and Diseases of the Chest, Ventnor, Isle of Wight.

This picture was painted by Mr. Lance Calkin, and is hung in the Dining-hall of the Hospital.

Photograph by Mr. J. E. Briddon, 137, High Street, Ventnor, Isle of Wight.

This Portrait is now on view in
the forecourt of the "Hassall Ward"
St.Mary's Hospital, Newport, Isle of Wight.

CHAPTER IV

OTHER ACTIVITIES — THE INHALATION TREATMENT FOR DISEASES OF THE RESPIRATORY ORGANS—CLIMATOLOGICAL AND METEOROLOGICAL OBSERVATIONS—RESEARCHES INTO THE CONSTITUTION OF INVALIDS' FOODS—THE FLASH-POINT OF PETROLEUM — IMPURE DRUGS - POISONOUS PIGMENTS — THE NATURAL COLOURING OF LEAVES, ETC.—ILLNESS AND DEATH

'. . . neque me vixisse pœnitet, quoniam ita vixi, ut non frustra me natum existimem. . . .'—CICERO: *De Senectute*, xxiii. 84.

'Homines enim ad deos nulla re proprius accedunt, quam salutem hominibus dando.'—CICERO: *Pro Q. Ligario*, c. 38.

MANY other matters engaged the attention of the subject of this memoir. He was the author of one of the very few works in the English tongue devoted to the subject of inhalation, as practised in cases of lung and throat disease:[1] a book which materially influenced contemporary medical thought. Long a resident of the Riviera, he produced two successful volumes on San Remo[2] and its neighbourhood, containing the results of climatological observations, and much information of the natural history of the surrounding districts.

Early in the 'sixties, with powerful arguments and steadfast persistence, he forced into the public mind a sense of the danger attending the use of low flash-point illuminating oils. The following passages are taken from his notable article (unsigned), in the *Lancet* of 1862,[3] 'On Paraffin Oil: its

[1] 'The Inhalation Treatment of Diseases of the Organs of Respiration' (Longmans, 1885).

[2] 'San Remo and the Western Riviera' (Longmans, 1879); and 'San Remo, Climatically and Medically Considered' (Longmans, 1883).

[3] The *Lancet*, 1862, i. 333.

Impurities and Adulterations,' which made a great impression, and served as a much-needed spur to various public authorities:

> After referring to—'The numerous . . . accidents which have recently resulted from the use of oils sold under the much-abused name of "Paraffin," as well as the late large importations of petroleum, or rock oil,' the writer of the article (Dr. Hassall) proceeds: '. . . A full and searching inquiry into the condition of the so-called paraffin oils now so largely sold . . . [is] imperatively demanded in the interests of the public safety. . . . The expression, "STANDARD OF SAFETY" . . . denotes the point at which the ignition of any oil may under all ordinary combinations of circumstances safely take place. This point we have fixed at 130° Fahr. for various reasons. . . . In summer the atmosphere sometimes reaches a temperature of over 100° F. . . . We are satisfied . . . from these and other considerations, that it would not be advisable to reduce the standard of safety; but we believe that it will be found sufficient, and it has the further advantages of being practical and simple. . . . The dealers in this article should in all cases require from the wholesale houses by whom they are supplied a guarantee that the oil they vend will not permanently ignite under a temperature of 130° F. . . . Much of what is now sold as paraffin oil is the mineral or rock oil recently imported, most of which reaches this country, as we have shown, in a dangerous condition, owing to its not having been properly refined.'

Again, in a letter to the *Standard*, dated February 15, 1864, he wrote:

> 'I purchased ten samples of oil. . . . One only . . . reached the standard of safety, 130 degrees Fahrenheit, now so generally adopted; while five, or one-half, were below the very unsafe parliamentary standard of 100 deg. Fahrenheit. But these samples gave off inflammable

> vapours much below the temperatures above enumerated . . . that is, some of the samples became inflammable when barely lukewarm, and even much below blood-heat. . . . The wonder is that accidents are not of constant occurrence.'

And in a further letter, dated February 18, 1864:

> 'I repeat, therefore, that the use of the petroleum or rock oil now sold in this metropolis is attended with great danger. . . .'

Faced by much doubtless conscientious, but extremely wrong-headed opposition, on the part of certain prominent pharmacologists,[1] Dr. Hassall, in his Evidence before the Parliamentary Committee of 1855, in his books on Adulterations, by his papers on Annatto and Liquorice, and in various other ways, made known to the public the immense extent to which *drugs*, as well as foods, were adulterated in those days. He taught the use of the microscope in their examination and discrimination, a lesson the value of which during recent years has been recognized by various official bodies and examining boards—the Local Government Board, the General Medical Council, the Institute of Chemistry, and the Pharmaceutical Society among the number.

Dr. Hassall very early gave a caution[2] against belief in the exaggerated statements, often made and still too generally credited, respecting the nutritive properties of 'Extract of Meat.' His conclusions, at first disdainfully rejected by Baron Justus von Liebig, were at a later date emphatically endorsed by Dr. Edward Smith, M.D., F.R.S., who, replying in the *Times* of October 16, 1872, to a rambling and irrelevant communication from the pugnacious Baron (the *Times*, October 1, 1872), had no difficulty in

[1] *Vide* Appendix A[1]; also the *Sunday Times*, October 14, 1855 (article, 'Are we being Poisoned?' referring to a foolish lecture which had been delivered by Mr. Jacob Bell); and the *Lancet*, 1855, ii. 444, 475, 586; 1856, i. 76, 102 (scathing articles, 'Adulteration shown to be Honest,' censuring the excusatory attitude adopted by Professor T. Redwood and Mr. Bell).

[2] The *Lancet*, 1865, ii. 49, 486; and 'Food, Water, and Air,' 1872, ii. 3.

showing that the latter had been compelled eventually to recognize their validity. For many years now it has been admitted that *extractum carnis*, though a useful stimulant, possesses a very low nutrient value.[1]

During a period of more than two decades Dr. Hassall made systematic meteorological observations, particularly in the Riviera, publishing the results in tables, papers, pamphlets, and in his larger works;[2] and latterly he was engaged in investigations on the colouring-matters of flowers, leaves, and fruits. These inquiries, interrupted by his death, nevertheless yielded various new and interesting results. An account of the earlier researches was contained in two papers presented to the Royal Society in 1892; further observations are detailed in the Appendix to Dr. Hassall's autobiography,[3] published in September, 1893; and in the writer's possession are notes of an elaborate series of allied investigations, some of which may be published in due course.

Dr. Hassall was the first to observe and explain (in papers read before the Royal Society in 1853 and 1854)[4] the frequent presence in the human renal excretion, under some pathological conditions, of the pigment indigo; and his conclusions, though received with doubt, were confirmed afterwards by Scherer. In 1859 was published his book on 'The Urine in Health and Disease,' a second edition of which appeared in 1863. This was an important work, embodying much original matter connected with the chemistry of urine; and the plates, many of them coloured by hand, were particularly good. Space will not permit more than a passing allusion to Hassall's many articles, papers, and letters, on other matters

[1] And latterly a demand has arisen for preparations in which protein is actually added to extracts of beef.—'It has always been an objection to the ordinary beef extracts that they do not contain any appreciable amount of protein; . . . in other words, that they are devoid of food value.'—From a report by R. Hutchison, M.D., in the *Medical Magazine*, March, 1908.

[2] See Appendix B[14]: a short article on Dr. Hassall by the late Dr. Robert Barnes in the *Quarterly Journ. Roy. Met. Soc.*, vol. xx., No. 90 (April, 1894).

[3] 'The Narrative of a Busy Life' (Longmans).

[4] *Proc. Roy. Soc.*, June 16, 1853, and *Phil. Trans.*, 1854, vol. cxliv., p. 297. A later paper, on 'Urinary Sediments,' appeared in the *Proc. Roy. Soc.* for 1859-60, vol. x., p. 281.

of practical, and in many cases of general public interest.[1] For these the reader is referred to the Autobiography already mentioned. The total number of his published books, separate monographs, signed papers, and letters, is not far short of two hundred. This is entirely apart from his innumerable unsigned articles in the *Lancet* and elsewhere.

Not the least remarkable circumstance connected with Dr. Hassall was that, notwithstanding these manifold distractions and the poorest health, he found it possible to continue in the active exercise of his profession as a physician from very early manhood to within a few weeks of his death. Among the appointments held by him for many years were those of Physician (ultimately Senior Physician) to the Royal Free Hospital, and Medical Referee to the United Kingdom Life Assurance Company, subsequently merged in the North British and Mercantile Insurance Company, to which he was for a number of years Consulting Physician. He was also, as might be expected, one of the earliest of the official analysts, and held for some time the appointment of Public Analyst for the Isle of Wight. In recognition of his great services he was elected, in 1875, the first Vice-President of the Society of Public Analysts.

The writer, it has been stated, was associated with Dr. Hassall during the later years of the latter's life. At different earlier periods, many English chemists, since become well known as authorities on various branches of research and analysis, gained experience from working in Dr. Hassall's laboratories. Among them may be mentioned the late Mr.

[1] Communications by Dr. Hassall at different periods were published in reference to the following, among many other, subjects: On the 'Water of the Serpentine' (*vide* references already given, p. 6; also 'Evidence before the Select Committee on the Serpentine, 1860,' Right Hon. W. F. Cowper, M.P., Chairman); on various forms of inhalers; on 'flour of meat'—a suggestion which, without acknowledgment, others have since adopted on a great scale; a carrying-chair for patients; poison-bottles; invalids' foods; bees and honey; the growth and development of fungi (*Trans. Roy. Med. Chir. Soc.*, second series, xviii. 23); the plastering of wine; the frequent occurrence at one period of arsenical and other poisonous pigments in paper hangings, curtains, etc. (*Lancet*, 1859-60); and the presence of lead in postage stamps. Mention should be made also of his advocacy of the sale of pure mustard, unmixed with farinaceous matter (*Lancet*, 1861, ii. 621), etc.

Alfred H. Allen, a distinguished former President of the Society of Public Analysts, and author of an unique work on analytical chemistry (whose earliest appointment was that of assistant to Dr. Hassall); Mr. Otto Hehner, another past President of the Society of Public Analysts, and an eminent expert in the chemistry of oils and fats; Dr. John Muter; Dr. A. Angell; Mr. W. D. Borland, one of our leading authorities on the chemistry and technology of explosives; Dr. F. S. Earp; Mr. T. Vosper; and the late Mr. R. J. Friswell, an original member of the Institute of Chemistry. Also, several of the best-known microscopic artists received their training under Dr. Hassall, wholly or in part.

From 1842-49 Dr. Hassall's place of residence was Norland Villa, 32, Addison Road North, Notting Hill, where he had a general medical practice. This, in 1849, he transferred to Mr. William Benjamin Hemming, surgeon, who continued the practice for some years. In 1850 Dr. Hassall removed to No. 66, Park Street, Grosvenor Square, where he appears to have formed his first laboratory. During the years 1854-57, Dr. Hassall lived at No. 8, Bennett Street, St. James's, S.W., and from 1857 until 1867 he resided and had his laboratory at 74, Wimpole Street, W. In 1868-69 the laboratories were at 11, Charles Street, Manchester Square; from 1870-74 at No. 2, Adelphi Terrace; in 1875 at 14, John Street, Adelphi, and also at Ventnor, Isle of Wight; in 1876 at 12, Pall Mall; and from 1877 onwards at No. 54, Holborn Viaduct, E.C.

Dr. Hassall died at San Remo, Italy, on April 9, 1894, after a comparatively short illness. He saw his patients until within a few weeks of his death, and died virtually 'in harness,' as he wished, after a devoted and strenuous scientific life, extending over sixty years. As a writer remarked, in one of the Italian journals published at the time:[1] '*Esercitava la professione come un alto sacerdozio e non per venalità.*' On the first anniversary of his death a Memorial Service was held at All Saints' Church, San Remo, a large congregation of all nationalities being present.

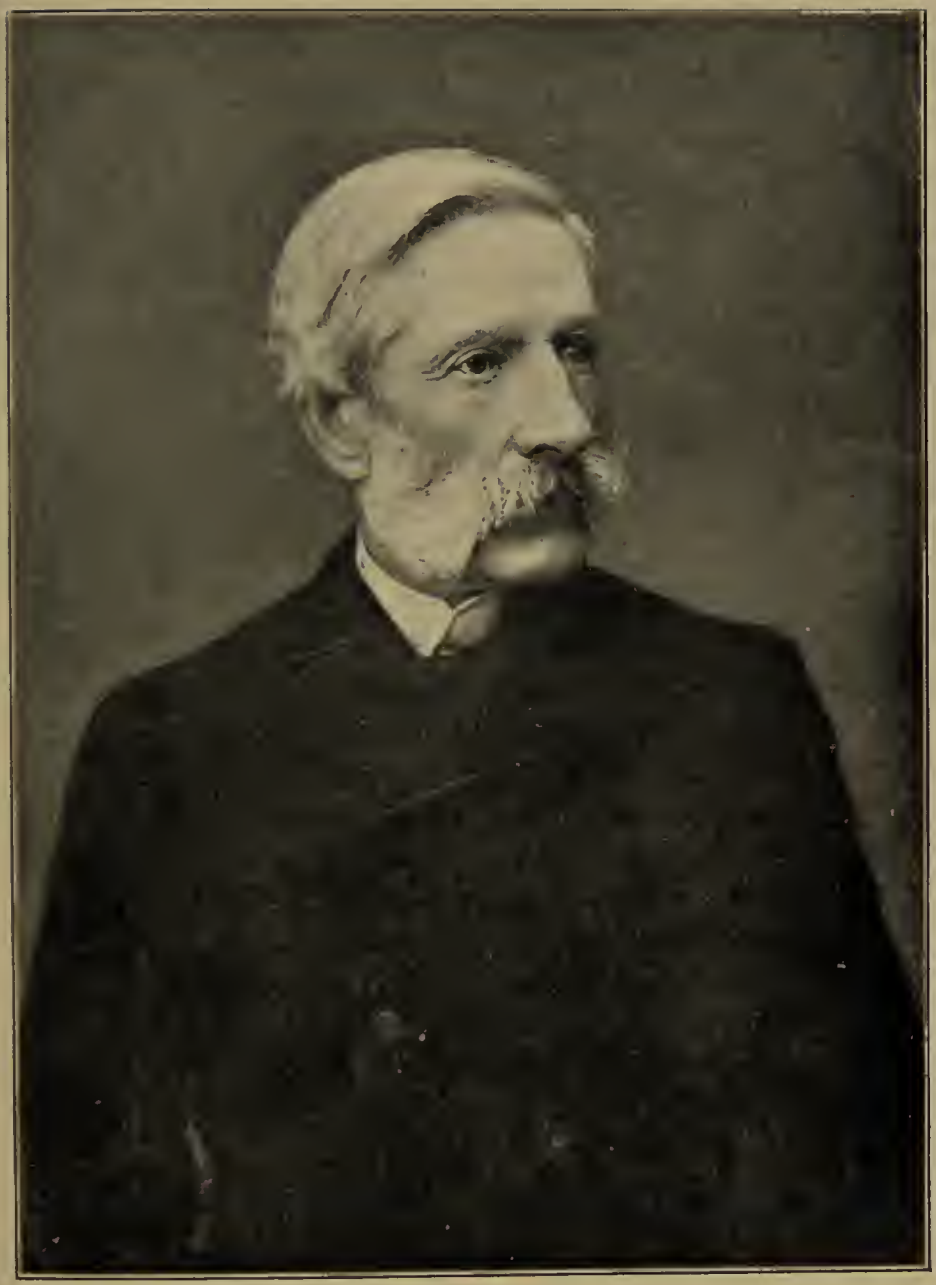
[1] *Il Pensiero di Sanremo*, April 15, 1894.

After the service, rendered by the Rev. H. de Romestin, Chaplain of All Saints' Church, a sermon was preached by the Rev. Hamilton S. Verschoyle, a valued friend of the deceased doctor. This eloquent address is included in the present volume.[1] When the service was over many of the Congregation proceeded to the cemetery, where a number of floral wreaths and crosses almost completely covered the grave.

Dr. Hassall was distinguished by a courteous, kindly manner, which belonged to the old-fashioned school, and is regrettably rare at the present day: 'gentleman' was, as some one said of him, 'written largely on his whole bearing.' His delicate features were keenly expressive of the brain, which remained so active to the last; and his slight, frail figure made the enormous amount of work which he succeeded in accomplishing, a wonder to men of sound health. Of amusements he had none: work was his pleasure and recreation; and this work, which he did without any proportionate or adequate reward,[2] verily lives after him. Much of it is of a *permanent* nature; and no motto could have been more happily chosen for him than that beneath the memoria picture at Ventnor: 'Non omnis moriar.'

[1] *Vide* Appendix E.

[2] 'Non enim penes eosdem est cultura scientiarum et præmium.'—'For the cultivation of science and its reward belong not to the same individual' (Francis, Viscount St. Albans, 'Novum Organum,' Book the First, xci.).



DR. ARTHUR HILL HASSALL.

From the last photograph taken at San Remo in 1893.

NOTE ON THE GENUS 'HASSALLIA'

THE history of the generic name, *Hassallia*, is interesting. Proposed in 1845 by Berkeley,[1] and containing five species (the last two doubtful)—Hassallia ocellata, H. compacta, H. turfosa, H. byssoidea, and H. limbata—the genus *Hassallia* was later (1848) newly defined by Count Vittore B. A. Trevisan, who, pointing out that Berkeley's *Hassallia* was identical with *Sirosiphon*, Kütz. (1843), applied the name to some other forms of algæ.

Count Trevisan's classification is quoted here, nearly verbatim, from his work on the subject:[2]

'[PROTOCOCCEÆ, TRIBUS I. POLYCOCCEÆ, TRIBUS II.]

'*Coccochlorideæ*, Tribus III.

'XIX. Genere.—Hassallia.

'Thallus e cellulis protogeniis cryptococcodeis sphæricoellipticis, themnogenesi simplici homogenea appendiculari multiplicatis, inordinatim et confertim dispositis, strato gelatinoso obvolutis, compositus.

'Il genere Hassallia proposto da Berkeley, e pubblicato nel 1854 (in Hassall "A Hist. of the Brit. Freshw. Alg.," p. 231), è identico col Sirosiphon di Kützing ("Phycol. gener.," p. 219), fondato nel 1843.

'*Erythræae*:—

'*Hassallia Hookeriana.*

Hæmatococcus Hookerianus, *Berkel.* et *Hassall* (MSS.). . . .

'*Hassallia insignis*—

Hæmatococcus insignis, *Hassall* ("Brit. Fresh. [Alg.]").

[1] Hassall's 'History of the British Freshwater Algæ,' 1845, pp. 231-239.

[2] V. B. A. Trevisan, 'Saggio di una Monografia delle Alghe Coccotalle,' p. 67; Padova, 1848

'*Hassallia cryptophila*—

Palmella cryptophila, *Carmich.* (MSS).
Hæmatococcus sanguineus, *Harvey* ([MS. ?] *in part*).
Hæmatococcus cryptophilus, *Hassall.*

'*Hassallia Allmani*—

Hæmatococcus Allmani, *Hass*[*all*].

'*Chlorina* :—

'*Hassallia Murorum*—

Protococcus viridis, *Agardh.*
Chlorococcum murorum, *Grevill.*
Chlorococcus muralis, *Menegh.*
Pleurococcus murorum, *Menegh.*
Hæmatococcus murorum, *Hass*[*all*].'

Subjoined is another extract from Trevisan's monograph:—

'III. Genere.—*Pleurococcus*, Menegh.

'Hassall abbraccia la falsa opinione di Greville ed Harvey che le cellule matrici de' Protococcus sieno "sessile on a gelatinous transparent mass": e questo errore influisce a fargliene commettere un altro, riunendo in uno solo i due generi Pleurococcus e Bichatia.'—*Trev.*, 1848, p. 31.

At a much later date (1886-88), BORNET and FLAHAULT revised the previous nomenclature, and retained, or rather, re-adopted, the name Hassallia, applying it to one species only, *Hassallia byssoidea*. Their reasons are given in the following extract:[1]—

'XVIII. *Hassallia*, Berkeley.

'In Hassall, "Hist . . .," I., p. 231, 1845, *pro parte*.

'Scytonema, Sirosiphon, Hapalosiphon, Tolypothrix spec. Fila fragilia pseudo-ramosa; pseudo-rami solitarii, eruptione laterali trichomatis formati, sub heterocysta ipsa, rarius inter heterocystas, egredientes. Vagina tenuis, sicca, fragilis. Algæ crustaceo-tomentosæ, minutæ. Plantae terrestres.

'Le genre Hassallia Berkeley fait double emploi avec deux genres antérieurement publiés: Sirosiphon Kützing et Stigonema Agardh; aussi n'a-t-il pas été admis. Nous le reprenons, non pas sous sa forme primitive, mais en le

[1] From Ed. Bornet et Ch. Flahault's *Révision des Nostocacées Hétérocystées* (1886-88), 4 parts and index, pp. 115-117.

limitant à une seule des espèces que Hassall lui avait attribuées, le *Hassallia byssoidea*. Nous trouvons à cette restitution le double avantage d'éviter la création d'un nom nouveau, *et celui de conserver dans l'usage courant une dénomination qui rappelle l'auteur d'un livre classique sur les Algues d'eau douce*.[1]

'Les Hassallia ont la même ramification que les Tolypothrix, mais leur port et leur station sont tout différents.

'*Specierum clavis Analytica.*

'Minor, in rupibus cretaceis immersa, Fila 5-7 μ crassa. 1. Hassallia Bouteillei.

'Cæspitoso-tomentosa ad cortices et rupes expansa. Fila 10-15 μ crassa. 2. Hassallia byssoidea.

'1. *Hassallia Bouteillei.*

'Sirosiphon Bouteillei Brébisson et Desmazières.

. . . Mougeot et Nestler. . . .

'Hapalosiphon Bouteillei. Borzi. . . .

'2. *Hassallia byssoidea*, Hassall.

'"Brit. Freshw. Algæ," Plate 67, Fig. 5.

'Scytonema Byssoideum. Berkeley, "Gleanings of Brit. Algæ," p. 47, 1833.

'Scytonema truncicola, Rabenhorst.

'Tolypothrix truncicola, Thuret.

'Hapalosiphon Byssoideus, Kirchner — Cooke, "Brit. Freshw. Algæ."

'Form α lignicola.

' ,, β saxicola.

'*Species inquirenda.*

'Hassallia (?) limbata, Hassall.

'*Species Excludendæ.*

'H. compacta = Stigonema sp.

'H. ocellata = ,, ocellatum. Thuret.

'H. turfosa = ,, turfaceum.'

Thus the generic name *Hassallia* has been applied, successively, to various algæ, by observers belonging to three different nationalities.—E. G. C.

[1] Italics mine.—E. G. C.

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1892. *On the Colour of the Leaves of Plants and their Autumnal Changes.* Paper communicated to the Royal Society by the Right Hon. Professor Huxley, F.R.S., received June 21, and read November, 1892. *Proc. Royal Soc.*, lii. (1893), 276; and *Appendix* to '*The Narrative of a Busy Life*,' 1893.

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ARTHUR HILL HASSALL, M.D., M.R.C.P.

From a photograph taken in 1879 by Barraud, 120, Fulham Road, S.W.

APPENDICES

APPENDICES

APPENDIX A.

DR. HASSALL AND *THE LANCET*.

I. *Extracts from 'The Lancet,' relating chiefly to Dr. Hassall and to the anti-adulteration movement.* [These are *in addition* to the excerpts in the body of the work.]

1.

'Dr. Hassall had . . . undertaken to prove . . . that a substance, or a compound of substances, that goes by the conventional name of annatto, was grossly adulterated.'—*The Lancet*, 1856, i. 76. [Leading article, strongly criticizing the attitude of certain pharmacists towards Dr. Hassall's disclosures of adulteration.]

2.

'If by a violent anachronism we imagine Dr. Hassall to have been an ancient Greek, and to have accompanied the army of Xenophon as Sanitary Adviser, he would have saved his ten thousand compatriots from eating the luscious honey gathered from the fair, but poisonous, flowers of the *Azalea Pontica*. The Athenian general and historian might have celebrated his name in words as lasting as the famous tribute of Homer to Medicine. As it is, it must be the duty of modern history to preserve him a foremost place amongst those who have proved in our day that

> 'A wise physician, skilled *to tell our food*,
> Is more than armies to his country's good.'

'It is in the systematic union of all the appliances of science, including those of chemistry, medicine, and natural history, that the superiority of Dr. Hassall's book over all its predecessors is displayed. It is no mere theoretical or partial account: it is complete and conclusive in every particular. . . . Dr. Hassall has achieved a great reputation for his skill in microscopical "differentiation," and in directing the faithful reproduction of microscopic pictures. . . .

'. . . We regard Dr. Hassall's book as one calculated to render a great public service, by placing within the hands of professional and scientific men an admirable handbook and guide to the detection of adulteration. . . . In this way, fraud being met and exposed at every turn, and in countless directions, no doubt a heavy blow and great discouragement will be dealt against the now rampant and blatant tribe of adulterators.

'In conclusion, we feel it to be a duty to bestow on this extraordinary work our strongest commendation.'—*The Lancet*, 1857, i. 119. [Review of '*Adulterations Detected*,' 1857.]

3.

'The following communication by Dr. Hassall, pointing out the precautions to be taken by tradesmen to avoid offences against the recent Act for preventing the adulteration of articles of food or drink, is worthy of attention: ". . . He [the retailer] should never purchase manufactured articles below the prime cost of the constituent ingredients. He should require, in all cases, a guarantee of purity from the manufacturer; and in order to fix the responsibility still more upon him, I would advise that the retailer should sell all manufactured articles in packages bearing upon them the names of the manufacturers. Further, I recommend that a warranty of purity be printed upon the wrapper of every parcel of manufactured goods sold. . . .

'"I see no objection to manufacturers and retailers supporting their own warranty by the testimony, in the form of certificates, of scientific persons of ability and reputa-

tion. . . .'"—*The Lancet*, 1860, ii. 272. [Editorial, '*The Adulteration of Food and Drink Act.*']

4.

'Dr. Hassall gives the following definition [of adulteration]: "Adulteration consists in the intentional addition to an article, for purposes of gain or deception, of any substance or substances, the presence of which is not acknowledged in the name under which the article is sold." If this common-sense view of the matter be taken at our police-courts, the fraud of adding wheaten flour to mustard, and other similar adulterations, will not go unpunished.'—*The Lancet*, 1861, i. 323. [Leading article on the Act for Preventing the Adulteration of Food, 1860.]

5.

'The question of pure food does not yield in importance and practical interest to any that has occupied the attention of those who are anxious to secure the largest possible share of public health; and we consider that the public at large are greatly indebted to Dr. Hassall for his arduous, persevering, and highly-successful labours in connection with this subject, and the profession not less so. . . . Dr. Hassall was the first to wield this powerful instrument [the microscope] with practical success in the detection of adulteration: what chemistry alone had failed to accomplish, he achieved by summoning to his aid the assistance of the microscope.'—*The Lancet*, 1861, ii. 501. [Review of Dr. Hassall's '*Adulterations Detected*,' second edition, 1861.]

6.

'To the question of food Dr. Hassall has, during the last fifteen years, devoted much labour. To his researches are due the detection of impurities in materials of daily consumption, and the checking of the practice of adulteration in its various disguises, whereby to the community has been secured greater purity and wholesomeness of their daily food, while the revenue has also been largely benefited, and the

public health improved. As an experienced microscopist and analyst, Dr. Hassall occupies a high position amongst those best competent to estimate that persistent zeal and continued application which have obtained for him so large a share of professional confidence and public favour. As senior physician to a metropolitan hospital, Dr. Hassall has had ample opportunities of observing the progress of epidemic diseases as they arise in and around the metropolis. His capability and competency have been submitted to the ordeal of public inquiry when giving evidence before the several parliamentary Committees and official commissions whose attention has been directed to sanitary measures.'—*The Lancet*, 1864, ii. 276. [Article referring to Dr. Hassall.]

7.

'It is with the greatest pleasure we announce that Her Majesty the Queen, at the instance of Lord Derby, has been pleased to grant a pension on the Civil List to Dr. Arthur Hill Hassall for his public and scientific services. No man who ever received a pension from the Crown more richly deserved it than our distinguished confrère. He has devoted his life to science and sanitary improvement. In science he stands among the highest, as his works . . . testify. But it is as a sanitary reformer, by his valuable reports on the Adulteration of Food and Drink, that Dr. Hassall's name will ever commend itself to the admiration and gratitude of his countrymen. As commissioner of *The Lancet* and analyst, he rendered services to society second to none of those of the greatest benefactors of mankind. It must be recollected that the inquiries which he conducted involved an amount of labour and of scientific knowledge which no other man probably would have been able to bring to bear upon the subject. He conducted many thousand investigations with such wonderful acumen and skill that the correctness of any one of those reports has never been successfully called in question. When *The Lancet* undertook the novel, and as it was believed at the time most dangerous, proceeding of

publishing reports on the Adulteration of Food, with the names of the offenders against the public welfare, it was fortunate indeed that Dr. Hassall was the gentleman selected to conduct the inquiry. It is certain that a man of less industry and powers of observation would have broken down in his task, and the proprietors of this journal might possibly have been materially injured, if not absolutely ruined, for their temerity.

'One remarkable instance, among many, may be mentioned to show with what fidelity and precision Dr. Hassall conducted his analyses. A specimen of flour of mustard reported to be perfectly pure was sent to *The Lancet* office. This was subjected to the careful scrutiny of our commissioner. He succeeded in detecting that the mustard had been adulterated to the extent of one grain in an ounce by a foreign substance. It was afterwards frankly acknowledged that the analysis was strictly correct.

'We pay this tribute of esteem to Dr. Hassall without making an unnecessary comment. It is honourable to Lord Derby that he should have recommended Dr. Hassall to a pension. It has not come a moment too soon. We regret to say that he is at present suffering from severe illness, mainly brought on by his indefatigable exertions in the interests of the public. Such a man can be ill spared. He is foremost among those benefactors of his kind who pursue an unostentatious and useful course, and whose services are so seldom appreciated until the martyrs are no longer in a position to reap the reward of their self-denying labours.'—*The Lancet*, 1866, ii. 499. [Leading article, 'Dr. Arthur Hill Hassall.']

8.

'*Dr. Hassall.*—The profession will learn with much satisfaction that Dr. Hassall, whose serious illness we announced nearly a year since, and who has been residing for some months past at Ventnor, has so far recovered his health as to be able to resume his professional duties. We trust that he will be spared for many years, and that he will soon be equal to the resumption of those useful and important

labours which have enabled him to effect so much good, and which have earned for him so well deserved a reputation.'—*The Lancet*, 1867, i. 673. [Short editorial.]

9.

'"*The Adulteration of Food and Drugs*" . . . the series of analyses with which Dr. Hassall's name will always be associated. . . .'—*The Lancet*, 1869, i. 96. [Article, urging the necessity 'to amend the Act of 1860 for Preventing the Adulteration of Articles of Food or Drink, and to extend the Act to the case of adulteration of drugs. The Act of 1860 was merely permissive, and the fines imposed by it were small.']

10.

'*The Adulteration Question*.' '. . . The discussion which has so recently taken place relative to it in the new House of Commons. We agree . . . that the subject is still one of great and even national importance. . . . While we appreciate the study which Mr. Pochin has evidently devoted to the subject, as well as the compliment paid to ourselves and Dr. Hassall, we demur altogether to his conclusions . . . it is incontestable that adulteration even now widely prevails.' . . . Dr. Hassall, who was consulted in reference to . . . [Mr. Scholefield's Adulteration Bill], tried hard to increase its stringency, but with very inadequate effect.'—*The Lancet*, 1869, i. 369. [Further Article, advocating an amendment of the Act of 1860.]

11.

'A Bill that has been repeatedly pressed upon the attention of the Legislature by a persevering member will in time almost certainly become law; and we cannot look forward to the enactment of such a measure as that of Mr. Muntz without feelings of gratification at the part taken by this journal in calling public attention to the want. We stood alone when Dr. Hassall, as the *The Lancet* analyst, conducted many thousand examinations of suspected articles. On the faith of his work we published the names of the dealers in

adulterated goods, and first made known the extent and magnitude of the evil. The dealers watched us with extreme solicitude; and a single mistake, a single erroneous charge, would have been made the basis of a law-suit, urged on with all the power of money, and with all the rancour of exposed dishonesty. The present Adulteration Act has failed to effect all that was required; but it asserts a principle, and will serve as a foundation for a better and more comprehensive superstructure.' — *The Lancet*, 1871, i. 354. [Article, '*The Adulteration Bill.*']

12.

'In connection with the movement now becoming general against the adulteration of food and drink, two articles . . . appear in "*Food, Water, Air.*" They will be found in all respects worthy of their author, Dr. Hill Hassall, the accomplished analyst. . . .'—*The Lancet*, 1872, ii. 652. [*Editorial* on the anti-adulteration movement.]

13.

'*Health Officers as Public Analysts.*'—*The Lancet*, 1872, ii. 689. [Letter from Dr. Hassall, pointing out the undesirability that both positions should be filled by Medical Officers of Health.]

14.

'*Officers of Health as Food Analysts.*'—*The Lancet*, 1872, ii. 761. [Further letter from Dr. Hassall, on the same subject.]

15.

'*The Inland Revenue Board and the Adulteration of Chicory.*' —*The Lancet*, 1873, i. 220. [Letter from Dr. Hassall.]

16.

'It was, as is well known, in the pages of this journal that the great subject of the Adulteration of Food and Drink and Drugs was first, and for a series of years, brought persistently under the notice of the profession and the public. The

scientific labour and responsibility, both very great, of these memorable reports of the Analytical Sanitary Commission rested mainly on Dr. Hassall; and some of the immediate results of these investigations were: first, to reveal the existence of almost universal and systematic adulteration in the classes of articles above enumerated; secondly, to occasion a vast diminution in the extent of adulteration, and a great improvement in its character; while, in the third place, these Reports afforded data for all the inquiries and legislation which have since taken place. Thus they led to the parliamentary inquiry, under the presidency of the late Mr. Scholefield, to the Adulteration Act of 1860, and to the more recent, and . . . much more effective Act of 1872. These were great achievements, purchased at the cost of great labour and immense responsibility; and we have just reasons to be proud of them. From the day when the first Reports of the Commission appeared in *The Lancet* . . . we have never ceased to devote . . . much time and attention to this great question. . . . We shall not consider that we have fully completed our purpose until, with others, we succeed in bringing about such alterations in the Adulteration of Food Act of 1872, as are necessary to render it as effective as possible. . . . Two things are requisite: first, that the right and best mode of proceeding under the existing Act, to render it as workable and effective as possible, should be clearly made known; and, secondly, that the amendments required in the Act, to render its working more efficient, should be plainly defined. With reference to both these objects, Dr. Hassall has recently drawn up two important documents, with the latter of which only we propose to deal. In this the following practical suggestions and recommendations are made. . . .'—*The Lancet*, 1873, i. 882. [Article, chiefly embodying the suggestions in question.]

17.

'If the Committee of the House of Commons now sitting under the presidency of Mr. Clare Read does nothing else, it will . . . have shown the public . . . the necessity . . . for

some sort of legal provisions to prevent the adulteration of food and drink. . . . From the time that the Bill became an Act [1872] . . . the weakness of its most important working clauses has been day after day more and more apparent . . . a very excellent letter on the subject from Dr. Hassall that appeared in *The Times* of the 8th inst.' *The Lancet*, 1874, i. 842. [Editorial on the Adulteration Act (1872), and the parliamentary inquiry into its operation.]

18.

'The Select Committee . . . having received some important and valuable evidence from Dr. Hassall, whose claims to be heard are undoubted, as he has devoted more than twenty years to analytical work. . . .'—*The Lancet*, 1874, i. 918. [Editorial on the Adulteration Act.]

19.

'. . . That Committee was not appointed either at the instance or in the interests of the public, but . . . it was due to the clamours of manufacturers and traders, who conceived that they were injuriously affected by the Adulteration Acts. . . . Of the witnesses actually examined, many were volunteers; and of this number was Dr. Hassall himself. Although he has devoted a lifetime to the question of adulteration, and the position which this subject has obtained in the public estimation is mainly due to his labours, yet he . . . had to tender his own evidence. . . . This report is faulty, erroneous, and highly mischievous.'—*The Lancet*, 1874, ii. 132. [*Article* referring to the 'inglorious labours' of the Committee of the House of Commons on Adulteration (1874), and its 'very remarkable report.']

20.

'At the time this journal took up the subject of adulteration, under the guidance of the late Mr. Wakley and Dr. Hassall, the public were both cheated and poisoned. . . . As far as the chief witness—Dr. Hassall—is concerned, the Report scarcely embodies a single one of the recommendations made by him

which bear immediately on the question—what constitutes adulteration? On the whole, we must pronounce this Report as erroneous, misdirected, and mischievous; and we earnestly hope that it will be repudiated alike by the public, by the Press, and by Parliament.'—*The Lancet*, 1874, ii. 202. [Further article expressing disappointment at the 'unfortunate Report' of the late parliamentary Committee.]

21.

'Mr. Sclater Booth has obtained leave to bring in a Bill to repeal . . . and to make better provision for the sale of food and drugs in a purer state. . . . The Bill should define what constitutes adulteration . . . by a series of definitions, applicable to each principal article . . . such a series . . . as has been drawn up with great care by Dr. Hassall, and . . . submitted by him to the Committee when he gave his evidence.'—*The Lancet*, 1875, i. 275.

22.

'The Adulteration Bill.'—*The Lancet*, 1875, i. 355. [Letter from Dr. Hassall against the Excise Laboratory being made the Court of Reference.]

23.

'No one living has a right to speak upon the subject of adulteration with such authority as Dr. Hassall, for, without wishing to undervalue the good work done by others before his time, it may be safely asserted that it is to his labours, first published in the pages of *The Lancet*, and continued without intermission for a quarter of a century, that we owe the public interest in the subject, and much of the scientific knowledge in regard to it which has already done so much to check the evil. It is nothing to say that it is the best [manual on food, etc.] in existence, for no other now extant can be compared with it. . . . Of course much prominence is given to microscopic work. Dr. Hassall was the first to use the microscope in this good cause, and it is now, and must ever remain, the only and unerring guide for certain

purposes; but the chemical methods are also numerous and good.'—*The Lancet*, 1876, i. 133. [Review of '*Food: Its Adulterations and the Methods for their Detection*,' 1876.]

24.

In an obituary notice (*The Lancet*, September 4, 1886) of the late James G. Wakley, M.D., who was for twenty-five years Editor of *The Lancet*, in succession to his father, Mr. Thomas Wakley, appeared the following reference to Dr. Hassall: 'He (Dr. Wakley) was also anxious that tribute should be borne to the work done by Dr. A. H. Hassall, when *The Lancet* exposed the adulteration of the food of the people. . . .'—*The Lancet*, 1886, ii. 465.

II. *The Agreement between the Editor of the Lancet and Dr. Hassall.**

'MEMORANDUM OF AGREEMENT BETWEEN MR. WAKLEY AND DR. HASSALL.

'Mr. Wakley agrees that Dr. Arthur Hassall shall have the sole right to republish for his own benefit, and in his own name, in a form separate from *The Lancet*, all reports and articles under the title of the Analytical Sanatory Commission projected by Mr. Wakley, and being accounts of analyses of food and drugs written by Dr. Hassall, as well those which have heretofore been as those which may be furnished by him to and published in *The Lancet*, before the twenty-fifth day of December, one thousand eight hundred and fifty-four.

* 'The Correspondence relating to the *Lancet* Sanatory Commission,' by J. C. Durnford, Esq., J. A. Power, M.A. Cantab., L.M., and Raymond S. Daniell, M.A. Oxon. W. Tegg and Co., 1856 (Pp. 32-34.)

This pamphlet contains a Summary (p. 31), compiled by the Rev. R. S. Daniell and Mr. G. Bolton, from Dr. Henry Letheby's accounts and receipts, for all the assistance he rendered, during the years 1851-54, at the request of Dr. Hassall, to the *Lancet* Commission; also a Table (pp. 2-5), showing the precise nature and number of analyses made, and by whom, during each of the four years (see *ante*, p. 28).

'First Title as to the Reports on Food.

'Reports from January 1, 1851, to December 31, 1854, inclusive, revised and extended, of the Analytical Sanatory Commission of *The Lancet* on 'Food and its Adulterations'; being Records of the Results of some Thousands of Microscopical and Chemical Analyses of the Solids and Fluids consumed by all Classes of the Public. By Arthur Hill Hassall, M.D., Chief Analyst of the Commission, Physician to the Royal Free Hospital.

'Second Title.

'Reports from January 1, 1851, to December 31, 1854, inclusive, revised and extended, on Food and its Adulterations, originally published in *The Lancet*; being Records of the Results of some Thousands of Microscopical and Chemical Analyses of the Solids and Fluids consumed by all Classes of the Public. By Arthur Hill Hassall, M.D., Chief Analyst of the Commission, Physician to the Royal Free Hospital.

'First Title as to the Reports on Drugs.

'Reports, revised and extended, of the Analytical Sanatory Commission of *The Lancet*, on Drugs, Chemicals, and Pharmaceutical Preparations, with their Impurities, Adulterations, and Falsifications; being Records of the Results of some Thousands of Microscopical and Chemical Analyses. By Arthur Hill Hassall, M.D., Chief Analyst of the Commission, Physician to the Royal Free Hospital.

'Second Title.

'Reports, revised and extended, on Drugs, Chemicals, and Pharmaceutical Preparations, with their Impurities, Adulterations, and Falsifications; being Records of the Results of some Thousands of Microscopical and Chemical Analyses, originally published in *The Lancet*. By Arthur Hill Hassall, M.D., Chief Analyst of the Commission, Physician to the Royal Free Hospital.

'Not any such Report on Food to be republished by Dr. Hassall until after the expiration of one year subsequent to its first publication in *The Lancet*, unless with the consent in writing of Mr. Wakley, his executors, administrators, or assigns.

'The republication of the Reports on Drugs not to include any report that has been published in *The Lancet* at a less period than two years from the time of its first publication in that journal, unless with the consent in writing of Mr. Wakley, his executors, administrators, or assigns.

'It is also agreed that if Dr. Hassall, or his assigns, republish the Reports on Food aforesaid, he or they shall, on or before the 25th day of December, 1855, purchase all the engravings used in such reports at one-half of the original cost of such engravings, and of the drawings from which they were made, this half amounting, to this date, 3rd September, 1853, to the sum of £29 12s. 3d., the half cost of all subsequent drawings and engravings to be ascertained and computed from the accounts of the artist and engraver.

'It is further agreed between the parties subscribing to this memorandum, that if Dr. Hassall, his executors, administrators, or assigns, shall not have republished the reports and articles, consent in writing, when necessary, having been given, or have purchased the drawings and engravings on or before the 25th day of December, 1855, then Mr. Wakley, his executors, administrators, or assigns, shall be at liberty to republish the said reports and articles in a separate form, as the same originally appeared in *The Lancet*. And further, in case the said Dr. Hassall, his executors, administrators, or assigns, shall, on or before the 25th day of December, 1855, have republished the said reports and articles in a separate form, then it shall be lawful for the said Mr. Wakley, his executors, administrators, or assigns, to republish the said reports and articles as the same originally appeared in *The Lancet*, also in a separate form, at any time after the expiration of five years from the date of the republication by Dr. Hassall; the right, however, of Mr. Wakley so to publish in a separate form is not in any manner to limit or restrict

Dr. Hassall's right of republication when, and as often, as he pleases.

'In the event of a republication by Mr. Wakley, his executors, administrators, or assigns, of any portion of *The Lancet* at any time, he reserves the right to the use of the engravings for such purpose; but the part or parts of *The Lancet* so to be republished are not to consist of any collection separate and apart from the other contents of *The Lancet* (except as hereinbefore provided) of the reports and articles, the right to the republication of which is hereby vested in Dr. Hassall, his executors, administrators, or assigns.

'Provided also that nothing herein contained shall prevent the republication by Mr. Wakley of any occasional report or article as aforesaid.

'But this shall not authorize Mr. Wakley to republish such reports or articles at stated periods, or in a collected form, except as hereinbefore mentioned, viz., five years after their first publication by Dr. Hassall, his executors, administrators, or assigns.

'THOMAS WAKLEY,
'ARTHUR H. HASSALL.

'Witness: WILLIAM HENRY STRANGE.
'*Dated 12th December*, 1853.'

APPENDIX B.

Passages from other medical and scientific journals; also from reviews, reports, books, articles, and obituaries [excluding those quoted in the text].

1.

'. . . Although, however, the means of adulteration have greatly increased, so also, fortunately, have the facilities for detection, especially by the improved use of the microscope, which has been employed by Dr. Hassall and others with signal success. . . .

'. . . The advantages of publicity have been urged by many witnesses, and especially by Dr. Hassall and Mr. Wakley, who attribute a recent great diminution in the amount of adulteration to the publication of names and other particulars in the reports of the "*Lancet* Commission."' —From the *Report of the Select Committee on Adulteration*, 1856.]

2.

'For fifty and odd nights Clown and Pantaloon have now been playing their pranks with tea and beer, bread and pudding. Those who delight in the rather unamiable fun of pantomimes have crowded . . . to see some stage countryman induced to drink a pint of blacking for brown stout . . . to see soot thrown into the washing-tub for the purpose of cleaning the clothes. Glorious clown! most sagacious pantaloon! the one represents the pleasure which the adulterator takes in outwitting mankind, the other the satisfaction which he feels in adding to his gains. They are now passing from the scene; the play is over, and here, at last, comes the reality. We have laughed our fill, and a committee of the House of Commons—commencing its labours where Dr. Hassall, who inaugurated the inquiry, concluded his—comes to declare in its critical way that we have been laughing at ourselves. The witnesses before this committee assure us that the tradesmen of London are playing the pantomime in real life and in deadly earnest; that we are the poor dupes, and that we have to pay for the sport which we give—to pay not only with our money, but with our lives. For the worst of it is, that the articles we purchase are, they tell us, not merely diluted, they are adulterated—positively, abominably, poisonously. There is scarcely, they say, a single article of daily use which it is possible to procure genuine from ordinary shops. We ask for bread, and we receive a stone; for coffee, and we receive chicory; for chicory, and we receive burnt carrots and powder of dried horses' liver; for oil of almonds, and we receive prussic acid, to heighten the enjoyment of the dessert by adding a little risk to it.'—*The Times*, March 3, 1856 [leading article].

3.

'It is difficult to exaggerate the importance of such a work as this; it attacks an evil almost universal, subtle, and dangerous in the highest degree: it points out the methods by which the legislature might protect us from it; or if, as is probable, our Government should consider the subject too insignificant . . . at least Dr. Hassall provides for individuals the means of, in some degree, guarding themselves against it, if they will take the trouble so to do. . . . We must hope that this subject will be taken up in earnest by the Government; they can plead no lack of information or advice; both have been supplied to them abundantly by different writers, but chiefly by the painstaking, learned, and conscientious author of the work we now recommend.'—*Dublin Review*, xlii. (1857), 534. [Review of '*Adulterations Detected*,' 1857.]

4.

'. . . Already the publication of Dr. Hassall's reports, as the Analytical Commissioner of *The Lancet*, has effected much good.'—*The Athenæum*, February 28, 1857. [Review of '*Adulterations Detected*,' 1857.]

5.

'. . . The disclosures made by Dr. Hassall in *The Lancet* newspaper, and also before a Committee of the House of Commons, revealed a state of matters in reference to the food of the people which is thoroughly disgraceful to a civilized community.'—*The Scotch Thistle*, June 27, 1857. [Review of '*Adulterations Detected*,' 1857.]

6.

'. . . [Dr. Hassall] . . . well known by his able investigations of the subject of the adulterations of food.'—*Pharmaceutical Journal and Transactions*, xvi. (1857), 185.

7.

'But the first systematic inquiry of real importance made into the subject in this country was that undertaken by an

Analytical Sanitary Commission, employed by the late Mr. Wakley, 'the Coroner,' and superintended by Dr. Arthur Hill Hassall. The reports made by this Commission appeared in *The Lancet*, of which Mr. Wakley was editor, during the years 1851 to 1854, and as collected in the volume which we have named first at the head of this paper they form a most valuable contribution to the literature of adulteration.'—*Westminster Review*, 1869, 186. [Referring to Dr. Hassall's '*Food and its Adulterations*,' 1855.]

7A.

'We do not doubt or deny the good services which Dr. Hassall has rendered to the public; but we tremble either to eat or drink after his book has come into our hands. We look askance at the innocent grocer, the virtuous and respectable milkman. The wretches!—have they not been poisoning us secretly in their back parlours?—mixing one knows not what abominations in our milk and in our tea? Yet the tea and the milk, where can we get substitutes for them—we, who can neither freight Chinamen, nor keep a dairy?'—*Blackwood's Magazine*, 1255, 229. [Review of '*Food and its Adulterations*,' 1855.]

8.

'. . . . It will be enough to refer to the Adulteration of Food Act, 1860, which was passed after a Parliamentary inquiry, instigated to a large extent by articles on the adulteration of food, which appeared in *The Lancet* in the years 1851, 1852, 1853, and 1854. That Act gave power to certain local authorities to appoint analysts having competent medical, chemical, and microscopical knowledge.'—*The Westminster Review*, cxxix. (1888), 24. [Article, '*Adulteration of Food, and the Remedy*.']

9.

'. . . The public may congratulate itself on the fact that the adulteration of . . . is a wholly obsolete iniquity. It is absolutely appalling to read what Dr. Arthur Hill Hassall.

"Chief Analyst of *The Lancet* 'Commission,'" had to say some years ago on the subject. . . . He found . . . but all these abominations must be considered as ancient history. . . . *The Lancet* Commission woke up the conscience of the manufacturer and the retail tradesman. . . .'—*The Daily Telegraph*, July 22, 1891. [Article on the adulteration of anchovies.]

10.

'He was the pioneer of food-analysts; his exposures were, no doubt, the originating cause which led to the state of public opinion out of which the original Adulteration Act and the present Sale of Food and Drugs Act have grown. . . .' —*The Chemist and Druggist*, October 28, 1893.

11.

'. . . We cannot but think that even the founding of the Hospital for Consumption at Ventnor, due to Dr. Hassall's untiring efforts, was less beneficial to British humanity than his share in *The Lancet's* crusade against adulteration of food and drugs. . . . *The Lancet* 'Analytical Sanitary Commission' was organized by Dr. Hassall and Mr. Wakley for the systematic examination of foods, etc., with the publication of names and addresses, in full, of the sellers of the substances analyzed. . . . The dealers remonstrated—naturally; but Mr. Wakley's courage and public spirit did him no injury. "A few lawyers' letters were received, and in one or two cases actions were commenced, but only went as far as the delivery of the declaration." This fact sufficiently proves the scientific accuracy of Dr. Hassall's work. . . .'—*Dublin Journ. Med. Science*, xcvii. (1894), 257 to 260. [Review of Dr. Hassall's *The Narrative of a Busy Life*.]

12.

'In 1850 he took up the question of food adulteration, and made a series of analytical reports, which led to a Parliamentary inquiry into the pernicious and systematic adulteration that had been going on. He also assisted in the

microscopical investigation of the water-supply of London, especially during the cholera outbreak of 1854. In 1877 Dr. Hassall removed to San Remo, and there passed the remainder of a busy and useful life.'—*Nature*, April 19, 1894.

13.

'By the death of Dr. Hassall, which occurred at San Remo, there has been removed from our midst one to whom the public and all public analysts owe a debt of gratitude, though the period of his activity, during which he became widely known, lies so remote from the present time, that to many of the younger generation his personality represents little more than a name. . . . He has left his mark beneficially on a number of divisions of natural science, although he had to work under conditions of poverty and ill-health which would have proved an effectual bar to persons less energetic and mentally less active. . . . he was one of the earliest to observe the occurrence of indican in the urine. Later still he founded the Royal National Hospital for Consumption and Diseases of the Chest at Ventnor, a hospital consisting of several blocks, and acknowledged to be a model of the Cottage Hospital type.

'But it is mainly in connection with the adulteration of food that Dr. Hassall's claim to public recognition rests. As early as 1850 he applied the microscope to the examination of food, and though this at the present time may seem to be a mere matter of course, and one which requires no ingenuity, yet up to that date it had not occurred to anyone to put this simple idea into actual practice. Dr. Hassall showed that it was easy to distinguish between coffee and chicory by means of the microscope at a time when this subject was a matter of parliamentary investigation. . . . This episode led to the institution, or rather the revival, by Mr. Wakley, . . . of the so-called "Analytical Sanitary Commission," which, in reality, was not a commission at all, as it consisted solely of Dr. Hassall. . . . These reports . . . caused an immense sensation. They were mainly founded upon the examination

under the microscope of those articles in which adulteration could be detected by that instrument. . . . As Dr. Hassall had no chemical knowledge beyond that which had survived from his medical student days, he obtained the assistance of Dr. Letheby for that portion of the work. [But see *ante*, pp. 25-28.—E. G. C.] Ultimately the publication of *The Lancet* reports led to Parliamentary action being taken, and this resulted in legislation against the adulteration of food; the reports were subsequently collected by Dr. Hassall and published separately. . . .

'To him public analysts owe most of their knowledge of the microscopic structure of food substances. His activity gave articulate form to the outcry against adulteration; he was truly the father of public analysis. In recognition of his great services he was elected the first Vice-President of the Society of Public Analysts, but he never took any active interest in the formation or actual working of the Society.

'To the end of his life he remained what he essentially was, a microscopist, not a chemist, or an analyst in the modern sense of the word. [*Vide* pp. 29 and 41.—E. G. C.] His merits are none the less for that fact, and his name will be long and gratefully remembered by the members of the analytical profession.'—*The Analyst*, xix. (1894), 97. [Obituary notice of Dr. Hassall.]

14.

'Dr. Hassall's work in Natural History, Hygiene, on Food, in Physiology and Medicine, was so striking that his contributions to Meteorology have hardly received the recognition they deserve. His work in this direction was not merely devoted to barren observation; but he applied it to the practical objects of the preservation of health and the cure of disease. It would be difficult to find in the history of Medicine a more valuable example of the application of meteorological science than that supplied by the National Hospital for Consumption at Ventnor, founded by him. . . . We cannot close this brief notice without recording one—

the last-proof of the keen devotion to the study of Nature which animated him throughout.

'He had kept up a systematic observation of the meteorological phenomena at San Remo for the last twelve years. This fact, and the knowledge that he was ever ready to enter upon new fields of investigation, induced me to seek his aid. . . . I wrote to him last February asking him to note the proportion of salt in the rain-water falling near the sea; that we might have a standard of comparison with rain coming from other seas besides the Mediterranean and further inland. He immediately set to work. In a letter dated February 21, he says: "No rain fell for some days after your letter. I have now, however, obtained two separate samples, and have determined the chloride of ammonium in each case. The amount . . . is . . . 0·040 per litre, equal in round numbers to about a grain. The smallness of the quantity is perhaps to be explained by the fact that there was no wind from the sea at the time." On March 27, he writes again: "In my own view of my case I think that there is little hope of contemporary recovery. With regard to salt in the air over the sea, it is astonishing, considering the winds, how little evidence there is of the presence of salt. One never feels it on one's lips; it never accumulates on the window-panes; and it is only now and again, owing to the absence of sea-weed, that you ever even get a sniff of the sea. The only evidence of saltness is that steel articles after a good deal of exposure become somewhat rusty."

'So that to the last he sought to unravel the arcana of Nature. On April 9 he died. No man had a better claim to the epitaph, "*Non omnis moriar.*" '—Article by the late Dr. Robert Barnes, *Quarterly Journal of the Royal Meteorological Society*, xx., No. 90 (April, 1894), p. 171.

[*Dr. R. Barnes* also wrote: 'I often think of the worldly success and honours men of infinitely less merit have managed, by dint of subserviency to those in influential positions, to achieve.'—*Dr. MacDougall* expressed the opinion: 'Most truly he did good work, and that with no adequate or

sufficient reward.' Another gentleman wrote, in reference to the anticipated continuance to Dr. Hassall's widow of the pension from the Civil List:—'which would be accepted by the whole medical profession as a well-deserved and gracious memorial of Dr. Hassall's public services.']

15.

'It is undoubtedly due to his ardent work in connection with sanitary reform that we have to-day such an elaborate method of supervising public health from a scientific point of view, and such widespread means for the detection of food adulteration.

'It was due to the movement he made in 1850 to devise methods for the detection of food adulteration that the matter was first taken up by *The Lancet*. As the result of his further researches, such an alarming state of affairs was revealed that a Select Parliamentary Committee was formed in 1885, the outcome of the labours of which being the first Food Adulteration Act of 1860.'—*The Chemical Trade Journal*, January 19, 1895.

16.

'Most eminent chemist of his time, he became associated with *The Lancet* Analytical Sanitary Commission, 1851-54, which led to the framing of the Adulteration Act of 1860 and finally to the adoption of the Foods and Drugs Act, 1875.'—*Notes and Queries*, 9th S., viii., July 20, 1901, 59.

17.

'*Hassall*, Arthur Hill . . . English physician and sanitarian; wrote reports in *The Lancet* (1851-54), which led to the passing of anti-adulteration Acts and the appointment of public analysts; conducted investigations during the cholera epidemic of 1853-54, during which he observed the organism "comma" bacillus, long afterwards described by Koch; and in 1868 founded the Consumption Hospital at Ventnor, advocating much of the open-air treatment now in vogue.'—['The Harmsworth Encyclopædia,' 1905, vol. iv.]

APPENDIX C.

THE PUBLIC TESTIMONIAL TO DR. HASSALL, 1856.

I. *The Circular Letter of Announcement, issued in* 1855.

'At a Preliminary Meeting of some Gentlemen interested in the various questions relating to the Public Health held at the Freemasons' Tavern, it was resolved to form a Committee for the purpose of raising a Public Testimonial to be presented to DR. ARTHUR HILL HASSALL, in recognition of his arduous, public-spirited, and successful labours in developing the resources of science, and applying them to the preservation of the Public Health.

'The grounds upon which this claim is founded are generally known, but it is desirable to state them distinctly in this place.

'Previously to Dr. Hassall's labours, chemistry had almost exclusively been relied upon to furnish evidence of the PURITY OR IMPURITY OF WATER. The microscope had been but incidentally employed, and had given no material assistance. To Dr. Hassall the honour is due of making this instrument subservient to the analysis of the ingredients, confounded by chemists under the general term of "organic matter," into their several living and dead animal and vegetable forms. The knowledge thus acquired led him to the discovery that the observation of the different organic structures often supplied the most direct evidence as to the sources and nature of the contamination of different waters; and he was hence enabled to establish, on a scientific basis, some of the most important principles relating to the supply and preservation of water, and which have, to a considerable extent, been adopted in the new Metropolis Water Bill,—for example, those relating to the sources of supply, conveyance in covered aqueducts, storage in covered reservoirs, the abolition of house-cisterns, and the consequent necessary adoption of the system of constant supply.

'The scientific originality of Dr. Hassall's labours in laying bare the health-destroying and fraudulent ADULTERATIONS OF FOOD AND DRUGS, is, if possible, still more

meritorious; and it would be difficult to over-estimate the public importance of the results obtained. The means previously relied upon to check these adulterations were the cumbrous and costly machinery of the Excise, and the subsidiary aid which chemistry could afford. The officers of the Excise were, for the most part, driven to seek for evidence by forcible entry and the seizure of articles found on suspected premises. When the art of the chemist failed, science was practically exhausted. So late as 1851, the then Chancellor of the Exchequer was able to quote in the House of Commons, as the deliberate opinion of three of the most distinguished chemists of the day, who had been specially requested to report upon the subject, "*that neither by chemistry nor by any other means could the admixture of chicory with coffee be detected.*" How completely this foregone conclusion has been exploded by the labours of Dr. Hassall, as Chief Analyst of the Sanitary Commission of *The Lancet*, is notorious. There is now nothing in science more certain and precise than the discrimination, by means of the microscope, of the various forms of vegetable tissues, no matter to what extent they may be pulverized, mixed, or even roasted.

'What the Excise aided by chemistry could not effect, an independent journal, by calling to its aid all the resources of modern science, has accomplished. *The Lancet*, by originating the Analytical Sanitary Commission, by the boldness of the scheme, and by the vigour with which it has been carried out, has done a service to the community which has been universally recognized. The merit of Dr. Hassall is distinct from this, but not less great. He has made that possible which before was held to be impossible. Through him we now possess the means of determining, with scientific accuracy, the purity or impurity of the chief aliments of man: and it certainly is fit and just that the credit of having been the first to demonstrate on a large scale the manifold adulterations of our food, our beverages, and our drugs, should be secured to him; and also that the skill and labour which he has expended should be authenticated.

'The interest of Dr. Hassall's researches is universal.

They have benefited the public revenue, every man in health or in sickness, and the physician who trusts in the properties of the agents, whether medicinal or dietetic, which he prescribes; and Parliament has been informed through them of new grounds and new principles of legislation. The great importance of the subject of the Adulteration of Food, Drink, and Drugs, has been recognized by Parliament, and this mainly through the labours of Dr. Hassall. The Select Committee on Public Houses embodied in their Report to the House of Commons the following distinct recommendation: "Your Committee are of opinion, that, as early as may be convenient, an inquiry should take place into the whole question of the adulteration of food, drink, and drugs. The suppression of adulterations is of the utmost importance, not to the consumers only, but in checking the dishonest competition so recklessly carried on to the ruin of fair trade." Acting on this recommendation, the House of Commons has just appointed, on the motion of Mr. Scholefield, *a Committee of Inquiry into the whole subject, with a view to some effective legislation.*

'On the grounds thus briefly stated, as well as on that of unwearied devotion to scientific pursuits, especially to subjects relating to the public health, for a period of nearly twenty years, it will be granted that the project now submitted of raising a Public Testimonial to Dr. Hassall is one in which men of all classes and of all professions may with propriety unite.'

II. *Names of the Committee.*

The Members of the General Committee were:

The Right Hon. the Earl of Hardwicke.
The Right Hon. the Earl of Shaftesbury.
Viscount Torrington.
Viscount Ebrington, M.P.
The Right Hon. C. P. Villiers, M.P.
Viscount Goderich, M.P.
Viscount Mandeville, M.P.
The Right Hon. Lord R. Grosvenor, M.P.
The Right Hon. Lord Claude Hamilton, M.P.
Lord Chief Baron Pigot.

William Acton, Esq., F.R.C.S.
Henry Allsopp, Esq.
S. N. Barber, Esq.
P. Edward Barnes, Esq., F.L.S.
Robert Barnes, M.D.
Michael T. Bass, Esq., M.P.
George Beaman, M.D.
J. Henry Bennet, M.D.
Elhanan Bichnell, Jun., Esq.
George Bottomley, Esq.
E. L. Boyd, Esq., F.S A.
C. H. Burton, Esq.
John Bradbury, Esq.
George Brown, Esq.
Edwin Chadwick, Esq.
W. Chowne, M.D.
Alfred Clark, Esq.
J. F. Clarke, Esq.
John Coppin, Esq., M.A. Cantab.
Rev. John Edmund Cox, M.A.
George Critchett, Esq., F.R.C.S.
Jonathan Crocker, Esq.
Frank Crossley, Esq., M.P.
Rev. Raymond S. Daniell, M.A.
J. C. Durnford, Esq.
George Edgar Dennes, F.L.S.
John Ellis, Esq.
William Everington, Esq.
William Farr, M.D., F.R.S.
W. H. Fenn, Esq.
J. G. Frith, Esq.
James Glaisher, F.R.S., F.R.A.S.
F. J. Graham, F.L.S.
R. D. Grainger, Esq., F.R.S.
J. Greatorex, Esq.
Henry Hancock, Esq., F.R.C.S.
Joseph Harvey, Esq.
Richard Hassall, M.D.
Sir Charles Hastings, D.C.L.
Thomas Hawksley, M.D.
E. Headland, Esq.
W. Bird Herapath, M.D., F.R.S.E.
H. J. Hinxman, M.D.
Jabez Hogg, M.D.
Edmund Hornby, Esq.
Herbert Holmes, Esq.
Rev. W. Laing, M.A.
Waller A. Lewis, M.D.
W. S. Lindsay, Esq., M.P.
Robert Lush, Esq.
Rev. Professor Markes.
William Marsden, M.D.
Gavin Milroy, M.D.
Sir James Murray, M.D.
Sheridan Muspratt, F.R.S.
J. Birkbeck Nevins, M.D.
W. P. Nichols, Esq., F.R.C.S.
Benj. Oliveira, Esq., M.P., F.R.S.
Rev. G. Osborne, M.A.
J. H. Paul, M.D.
Alfred Power, Esq.
John A. Power, L M., M.A.
John Power, M.D.
W. H. Ranking, M.D. Cantab.
Rev. G. Renaud, M.A.
J. Reynolds, Esq.
Rev. B. C. Sangar, M.A.
John Savery, Esq., M.B.
John Scott, Esq.
Joseph Seaton, M.D.
T. Shapter, M.D.
Osborne Smith, Esq., F.S.A., F.R.G.S., F.S.S.
Southwood Smith, M.D.
Professor W. Stokes, M.D.
John Straker, Esq., J.P.
William Tegg, Esq.
R. B. Tennent, Esq.
R. D. Thomson, M.D., F.R.S.
F. H. Thomson, Esq.
R. B. Todd, M.D., F.R.S.
William Tucker, M.D.
Sir Walter Trevelyan, Bart.
Timothy Tyrrell, Esq.
George Alfred Walker, Esq.
Thomas Watson, M.D. Cantab.
John Wiblin, Esq., F.R.C.S.
W. Wilde, Esq., F.R.C.S.
Charles Wing, Esq.
Forbes Winslow, M.D., D.C.L.

And the following, amongst many others, expressed approval of the proposed testimonial, to which they subscribed:

Lord Wharncliffe.
Lord Stanley, M.P.
Sir B. Hall, Bart., M.P.
Earl of Ducie.
W. J. Evelyn, Esq., M.P.
Professor Parkes, M.D.
John Simon, F.R.S.
R. Stephenson, Esq., M.P., F.R.S.
John Stenhouse, LL.D., F.R.S.
Montague Chambers, Esq., M.P.
William Scholefield, Esq., M.P.
Samuel Gregson, Esq., M.P.

III. *The Presentation and Dinner.*

1.

'*The Hassall Testimonial Dinner.*—Yesterday, after some little delay from unavoidable circumstances, was finally fixed for the festival (held at the Freemasons' Tavern) in especial honour of Dr. Hassall, whose services to the community, as the detector of adulterations in almost every article of nutriment, whether solid or liquid, are already well known, and generally acknowledged with gratitude. Dr. Hassall has "done the State some service," and it is gratifying to find the profession to which he belongs coming forward in a body to do him honour. The first practical result of the learned Doctor's labours was the appointment of the Select Committee of the House of Commons on the Adulteration of Food, and there is now every probability that their report will be followed up by some stringent legislative enactment. The chair was to have been occupied yesterday by Lord Ebrington, M.P., but, in his unavoidable absence from an attack of ophthalmia, it was filled, and most efficiently, by Lord William Lennox. His lordship was supported by Mr. Oliveira, M.P., Mr. Wakley, the Rev. Mr. Daniell (hon. secretary to the testimonial), Mr. Thwaites (the President of the Board of Works), Dr. Waller Lewis, Mr. Mechi, and many other gentlemen of influence in their respective vocations. Owing to the Whitsuntide recess, several members of both Houses of Parliament who would otherwise have been present were unavoidably kept away, and among them were the Earl of Shaftesbury, Viscount Goderich, M.P., the Hon. W. Cowper, M.P., Mr. Scholefield (the Chairman of the Adulteration Committee of the

House of Commons), and Mr. Villiers, M.P. After the usual loyal and constitutional toasts, the noble Chairman rose and recorded the great merits of Dr. Hassall, dwelling upon the scientific originality of his labours, and the untiring zeal and energy with which he had prosecuted his investigations. The toast was drunk with the greatest enthusiasm. Dr. Hassall, in an eloquent and interesting speech, warmly acknowledged this gratifying recognition of his labours, gave a brief but lucid history of the subject of adulteration, and stated that he relied mainly for its suppression upon free publicity, citing at the same time some striking instances of the value of the microscope in the detection of adulteration. He took occasion to refer more especially to the obligations incurred by the public to Mr. Wakley, from the indomitable courage evinced by that gentleman in running the risk attendant upon the publication of the names and addresses of the merchants and tradesmen whose goods had been analyzed and "found wanting," both in quality, measure, and weight. Dr. Hassall concluded by gratefully accepting the testimonial presented to him by so distinguished a meeting. The testimonial itself is a beautiful work of art, designed from Milton's "Paradise Lost," by the Rev. G. M. Braune, M.A. It represents the angel Ithuriel, clad in armour, touching with his spear Satan, who, having assumed the shape of a toad, sat close to the ear of Eve, tempting her.[1] The testimonial stands about 3 feet 6 inches in height, the figure is modelled by M. Fréret, and executed by Messrs. Barnard and Sons. One of the panels of the pedestal is occupied with a basso-relievo representing the microscope and the chemical apparatus employed in the discovery of adulteration, while another bears an appropriate inscription. The health of the noble Chairman was proposed in a flattering speech by Mr. Oliveira, M.P., and aptly acknowledged. Dr. Hassall then proposed "The Health of Mr. Wakley," the originator of the Analytical Commission appointed by the proprietors of *The Lancet*. This toast was received with much applause, and Mr. Wakley, in returning

[1] For an illustration of this finely modelled and graceful statuette, see *ante* p. 43.

thanks, jocosely intimated that this evening, for once, he had enjoyed "unadulterated" pleasure. The hon. gentleman at the same time took occasion to express his regret at a temporary estrangement from Dr. Hassall ("a mere lovers' quarrel"), declaring that he came to the festival for the express purpose of bearing his testimony to Dr. Hassall's inflexible integrity and brilliant abilities, and assuring his (Dr. Hassall's) "slanderers" that they should not assail him unjustly. Dr. W. Lewis afterwards proposed "The Select Committee of the House of Commons on the Adulteration of Food." Mr. Mechi gave "The Press," which was responded to by Mr. Warren; and special toasts were subsequently drunk in honour of Mr. Thwaites, the Chairman of the Metropolitan Board of Works, and Mr. Mechi, as an agricultural improver, to whose merits ample justice was rendered by Mr. Wakley. The festival was protracted to a very late hour of the evening.'—*The Times*, May 16, 1856.

[A similar account of this function appeared in *The Lancet*. 1856, i. 562.]

2.

'Yesterday the ceremony of presenting a testimonial to Dr. Hassall, in recognition of the benefits which he has conferred on the community by his scientific labours in connection with the subject of adulteration, took place at a public dinner at the Freemasons' Hall, at which Lord William Lennox presided, in the absence of Viscount Ebrington, M.P., who was prevented from attending by sudden indisposition. About 100 gentlemen, comprising noblemen, members of Parliament, and others eminent in science and literature, were present on the occasion, amongst others the following: Mr. Oliveira, M.P., Sir Thomas Tancred, Mr. Wakley, Admiral Duntze, Major Sibthorp. M.P., Mr. Thwaites (the President of the Board of Works), Dr. Farr, F.R.S., Mr. Tuxford, Mr. Harvey, Mr. Hancock, Dr. Bennet, Dr. Waller Lewis, Rev. R. S. Daniell, Dr. Barnes, and many others.

'After the usual loyal and constitutional toasts,

'The CHAIRMAN proposed "The Health of Dr. Hassall,"

and after an appropriate allusion to the testimonial, he dwelt on the great benefits conferred by the labours of Dr. Hassall on all classes of the country, but especially the poorer class, who had neither deer parks, nor pheasant preserves, nor fisheries from which to draw the unadulterated elements of life and health, but were compelled to buy the necessaries of life as they were sold to them in the shops. He rejoiced that they lived in an age when the services of such a man as Dr. Hassall could be appreciated by the public, and when it was no longer necessary for the man of talent to bow, and fawn, and cringe in the vestibule of some noble aristocrat to have his services recognized. (Cheers.) They no longer lived in the times described by Swift, when the man of talent was paid by "good words and bad dinners." The man who showed talent was now sure of appreciation, and it was on that ground he proposed the health of Dr. Hassall. (Cheers.)

'The toast having been duly honoured,

'Dr. HASSALL acknowledged in warm and grateful terms this highly gratifying recognition of his labours, gave a short history of the subject of adulteration, and stated that he relied mainly for its suppression upon free publicity, and cited some striking instances of the value of the microscope in the detection of adulteration. He took occasion to refer especially to the obligations the community is under to Mr. Wakley for the courage which he evinced in incurring the risk attendant upon the publication of the names of the merchants and tradesmen whose goods had been subjected to analysis.

'The testimonial is an exquisite work of art, designed from Milton's "Paradise Lost" by the Rev. G. M. Braune, M.A. It represents the angel Ithuriel, clad in armour, touching with his spear Satan, who, having assumed the shape of a toad, sat close to the ear of Eve, tempting her:

> '"Him thus intent Ithuriel with his spear
> Touch'd lightly; for no falsehood can endure
> Touch of celestial temper, but returns
> Of force to its own likeness; up he starts
> Discover'd and surprised."
>
> *Paradise Lost*, book iv.

'The testimonial stands about 3 feet 6 inches in height, and the figure is modelled and chased in a manner rarely equalled in this country. One of the panels of the pedestal is occupied with a "basso-relievo," representing the microscope and the chemical apparatus employed in the discovery of adulteration, while another bears the following inscription: "To Arthur Hill Hassall, M.D., F.L.S., Analyst of *The Lancet* Sanitary Commission, and Author of the Reports of that Commission, entitled, 'Food and its Adulterations,' by members of both the Houses of Parliament, by members of the learned professions, and by others connected with science, literature, and commerce, in recognition of eminent public benefits conferred by his rare scientific skill and indefatigable labour in the detection and exposure of a pernicious and systematic adulteration of food and medicine.—May 15th. 1856." The symbolism of the design will be readily perceived. The Spirit of Good, as represented by the angel, is employing science, symbolized by the spear, for the discovery of truth, under the talismanic touch of which the fraud and falsehood of adulteration, in the semblance of a toad, spring to light.

'The other toasts of the evening were: "The Health of the Chairman," proposed by Mr. Oliveira; "The Health of Mr. Wakley," proposed by Dr. Hassall; "The Adulteration of Food Committee," proposed by Dr. Waller Lewis; "The Metropolitan Board of Works," acknowledged by Mr. Thwaites, etc. The musical arrangements were conducted under the superintendence of Mr. Genge. Mr. Higgins performed the duties of toastmaster, and there was a general expression of satisfaction at the dinner arrangements of Mr. Shrewsbury.'—*The Daily News*, May 16, 1856.

3.

'The scientific labours of Dr. Hassall in connection with the Select Committee appointed by the House of Commons to inquire into the adulteration of food are, no doubt, fresh in the memory of our readers. His services to the community, as the detector of adulterations in almost every

article of nutriment, whether solid or liquid, are widely known, and generally acknowledged with gratitude. Most gratifying, therefore, it is to find the profession to which he belongs coming forward in a body to do him honour, and present him with an appropriate testimonial.

'Some delay, it appears, had, from unavoidable circumstances, occurred in going through this ceremony; but at length, on the 15th instant, the festival was held at the Freemasons' Tavern. The chair was to have been occupied on the occasion by Lord Ebrington, M.P., but in his unavoidable absence it was filled, and most efficiently, by Lord William Lennox. After the usual loyal and constitutional toasts, the noble Chairman rose and recorded the great merits of Dr. Hassall, dwelling upon the scientific originality of his labours, and the untiring zeal and energy with which he had prosecuted his investigations. The toast was drunk with the greatest enthusiasm. Dr. Hassall, in an eloquent and interesting speech, warmly acknowledged this gratifying recognition of his labours, gave a brief but lucid history of the subject of adulteration, and stated that he relied mainly for its suppression upon free publicity, citing at the same time some striking instances of the value of the microscope in the detection of adulteration. He took occasion to refer more especially to the obligations incurred by the public to Mr. Wakley, the Coroner for Middlesex, from the indomitable courage evinced by that gentleman in running the risk attendant upon the publication of the names and addresses of the merchants and tradesmen whose goods had been analyzed and "found wanting," alike in quality, measure, and weight. Dr. Hassall concluded by gratefully accepting the testimonial presented to him by so distinguished a meeting. The testimonial itself is a beautiful work of art, designed from Milton's "Paradise Lost" by the Rev. G. M. Braune, M.A. It represents the angel Ithuriel, clad in armour, touching with his spear Satan, who, having assumed the shape of a toad, sat close to the ear of Eve, tempting her. The testimonial stands about 3 feet 6 inches in height; the figure is modelled by M. Fréret. One of the panels of

the pedestal is occupied with a basso-relievo representing the microscope and the chemical apparatus employed in the discovery of adulteration, while another bears the following appropriate inscription :

'"To Arthur Hill Hassall, M.D., F.L.S., Analyst of *The Lancet* Sanatory Commission, and Author of the Reports of that Commission, entitled, 'Food and Its Adulterations,' by Members of both Houses of Parliament, by Members of the Learned Professions, and by Others connected with Science, Literature, and Commerce, in recognition of eminent public benefits conferred by his rare scientific skill and indefatigable labour in the detection and exposure of a pernicious and systematic adulteration of food and medicine. May 15th, 1856."'—*The Illustrated Times*, May 31, 1856. [This account was accompanied by an engraving of the statuette.]

4.

(*Another Account.*)—'The ceremony of presenting a testimonial to Dr. Hassall, in recognition of the benefits which he has conferred on the community by his scientific labours in connection with the subject of adulteration, took place on Thursday last at a public dinner at the Freemasons' Hall, at which Lord William Lennox presided in the absence of Viscount Ebrington, M.P., who was prevented from attending by sudden indisposition. About 100 gentlemen, comprising noblemen, members of Parliament, and others eminent in science and literature, were present on the occasion, amongst others the following: The Earl of Orkney, Viscount Ranelagh, Mr. Montague Chambers, M.P., Mr. Oliveira, M.P., Mr. Bass, M.P., Sir Thomas Tancred, Mr. Wakley, Admiral Duntze, Major Sibthorp, M.P., Mr. Thwaites, the President of the Board of Works, Dr. Farr, F.R.S., Mr. Tuxford, Mr. Harvey, Mr. Hancock, Dr. Bennet, Dr. Waller Lewis, Dr. Forbes Winslow, Dr. Barnes, and many others. Owing to the Whitsuntide recess several members of both Houses of Parliament who would otherwise have been present, were unavoidably kept

away, and amongst them, we understand, were the Earl of Shaftesbury, Viscount Goderich, Mr. Scholefield (the Chairman of the Adulteration Committee of the House of Commons), and Mr. Villiers (members of the same Committee).

'The Chairman, in a graceful address, warmly recorded the great merits of Dr. Hassall, and dwelt upon the scientific originality of his labours, and upon the untiring zeal and energy with which he had prosecuted his investigations. His lordship enlarged upon the general subject of adulteration in its several aspects, and especially in its relations to the revenue, public health, and morality, and in due form presented the testimonial.

'Dr. Hassall acknowledged in warm and grateful terms this highly gratifying recognition of his labours, gave a short history of the subject of adulteration, and stated that he relied mainly for its suppression upon free publicity, and cited some striking instances of the value of the microscope in the detection of adulteration. He took occasion to refer especially to the obligations the community is under to Mr. Wakley for the courage which he evinced in incurring the risk attendant upon the publication of the names of the merchants and tradesmen whose goods had been subjected to analysis.

'The testimonial is an exquisite work of art, designed from Milton's "Paradise Lost," by the Rev. G. M. Braune, M.A. It represents the angel Ithuriel, clad in armour, touching with his spear Satan, who, having assumed the shape of a toad, sat close to the ear of Eve, tempting her.

> '"Him thus intent Ithuriel with his spear
> Touch'd lightly; for no falsehood can endure
> Touch of celestial temper, but returns
> Of force to its own likeness; up he starts
> Discover'd and surprised."
>
> *Paradise Lost*, book iv.

'The testimonial stands about 3 feet 6 inches in height, and the figure is modelled and chased in a manner rarely equalled in this country. One of the panels of the pedestal is occupied with a basso-relievo, representing the micro-

scope and the chemical apparatus employed in the discovery of adulteration, while another bears the following inscription:

TO

ARTHUR HILL HASSALL, M.D., F.L.S.,

ANALYST OF *THE LANCET* SANATORY COMMISSION, AND AUTHOR OF THE REPORTS OF THAT COMMISSION, ENTITLED "FOOD AND ITS ADULTERATIONS,"

BY

MEMBERS OF BOTH THE HOUSES OF PARLIAMENT, BY MEMBERS OF THE LEARNED PROFESSIONS, AND BY OTHERS CONNECTED WITH SCIENCE, LITERATURE, AND COMMERCE,

IN RECOGNITION

OF EMINENT PUBLIC BENEFITS CONFERRED BY HIS RARE SCIENTIFIC SKILL AND INDEFATIGABLE LABOUR IN THE DETECTION AND EXPOSURE OF A PERNICIOUS AND SYSTEMATIC ADULTERATION OF FOOD AND MEDICINE.

MAY 15, 1856.

'The symbolism of the design will be readily perceived. The Spirit of Good, as represented by the angel, is employing Science, symbolized by the spear, for the discovery of Truth, under the talismanic touch of which the fraud and falsehood of Adulteration, in the semblance of a toad, spring to light.'

APPENDIX D.

THE FOUNDATION OF THE VENTNOR HOSPITAL.

I. *Copy of the Original Prospectus, with some Appended Extracts from the Press.*

THE

VENTNOR HOSPITAL

FOR

CONSUMPTION AND DISEASES OF THE CHEST.

Patron.

[There was a blank here in the Prospectus issued in 1867. On January 23, 1872, Queen Victoria consented to become the Patron. At the present time the Royal Patrons are the King and Queen, the Prince of Wales, the Duchess of Argyll, and Princess Henry of Battenberg.—E. G. C.]

Patronesses.

LADY ALICIA BRISTOWE, Datchet House, near Windsor.
LADY CHEAPE, Old Park House.
LADY DE LA FELD, Feldenstein, Richmond.
THE LADY CATHERINE HARCOURT, St. Clair.
MRS. BENJAMIN HARVEY, The Boltons.
MISS LEE, The Cottage, Bonchurch.
THE DOWAGER MARCHIONESS OF LOTHIAN, 15, Bruton Street, W.
THE COUNTESS OF MORNINGTON, Mornington Hall.
THE HON. MRS. PELHAM, St. Lawrence.
MRS. A. PRESCOTT, Clarence, Roehampton.
LADY CAROLINE RUSSELL, Lowndes Square.
MISS SELWYN, Sandwell Hall, Warwickshire.
MRS. VERNER, Steephill Castle.
THE MISSES WARD, West Hill, Cowes.

President.

THE RIGHT HON. VISCOUNT EVERSLEY, Governor of the Isle of Wight.

Vice-Presidents.

EDWIN CHADWICK, ESQ., C.B., Richmond.
GENERAL SIR JOHN CHEAPE, Old Park House.
SIR AUGUSTUS CLIFFORD, BART., Ryde.
HIS GRACE THE DUKE OF NEWCASTLE, Clumber.
SIR H. P. GORDON, BART., Northcourt.
COLONEL VERNON HARCOURT, St. Clair, Ryde.
R. W. KENNARD, ESQ., M.P., Porchester Terrace.
CAPTAIN BEAUCHAMP KERR, West Cliff, Niton.

SIR CHARLES LOCOCK, BART., Binstead.
C. WYKEHAM MARTIN, ESQ., M.P., Leeds Castle, Kent.
CHARLES MORRISON, ESQ., Harley Street.
SIR HENRY OGLANDER, BART., Nunwell.
THE RIGHT HON. SIR LAURENCE PEEL, Bonchurch.
THE HON. EVELYN PELHAM, St. Lawrence.
SIR JOHN SIMEON, BART., M.P., Swainston.
SIR HARRY VERNEY, M.P., Claydon House, Winslow.
GEORGE YOUNG, ESQ., Apley Tower, Ryde.

Treasurer.

LIEUTENANT-COLONEL VERNER, Steephill Castle.

Committee of Management.

Chairman—THE RIGHT HON. SIR LAURENCE PEEL, President of Guy's Hospital.

THE PRESIDENT.
THE VICE-PRESIDENTS.
C. F. FISHER, ESQ., Grove Hill Cottage.
E. M. FRERE, ESQ., Bonchurch.
MAJOR GRAY, Ariosto Villa.
DR. HASSALL.
REV. CLIFFORD MALDEN, St. Lawrence.
G. W. OLIVER, ESQ., Strathwell.
THE REV. A. L. B. PEILE, Beacon House.
THE REV. C. WILLS, The Vicarage.

Consulting Physicians.

DR. BURROWS, F.R.S., President of the Medical Council.

Physician.

ARTHUR HILL HASSALL, M.D., Senior Physician to the Royal Free Hospital, London.

Surgeons.

JOHN B. MARTIN, ESQ., M.R.C.S. H. B. TUTTIETT, ESQ., M.R.C.S.

Honorary Architect. Honorary Secretary. Collector.

T. HELYIER,[1] ESQ. MR. GEORGE WELLS, Ventnor. MR. FRANK HOBBY.

Bankers.

LONDON AND WESTMINSTER BANK, St. James's Square. LONDON JOINT STOCK BANK, Pall Mall.

HAMPSHIRE BANKING COMPANY, Ventnor.

London Offices.

11, Charles Street, Manchester Square.

[1] The spelling of this name is incorrect. The architect's name was *Hellyer*.—E. G. C.

Considering the reputation which VENTNOR and the UNDERCLIFF have so long and justly enjoyed for the alleviation and cure of consumption and other diseases of the respiratory organs, it is not a little remarkable that an Institution for the treatment of persons labouring under those affections should not hitherto have been formed in this highly-favoured locality.

That such an Institution would be the means of saving the lives of many persons, and would afford relief and comfort to many more, is unquestionable.

That there are numerous residents in this district, not a few of whom have been themselves sufferers from Consumption, Bronchitis, or some allied affection, who would gladly aid in the good work of establishing such a Hospital, is equally certain; as also that it would command a large amount of support from the general and benevolent public.

These, and some other considerations presently to be referred to, are so weighty that it has been determined to address an appeal to the charitable and the affluent, with a view to the formation of 'THE VENTNOR HOSPITAL FOR CONSUMPTION,' and Diseases of the Chest.

In furtherance of this humane and benevolent object, the aid and co-operation of all parties and classes is earnestly solicited.

Consumption is the most prevalent and fatal of the maladies which afflict mankind. Of the 65,000 deaths from slow and lingering diseases which, according to the last returns of the Registrar-General, occur every year in England and Wales, about 39,000 are due to Consumption alone; in other words, about one-fifth of the entire mortality of adults is due to that exterminating disease.

Notwithstanding that it is the most frequent and mortal of affections, yet less has been done to provide for the necessities and alleviate the sufferings of those labouring under it than for any other disease. Owing to their protracted nature and the consequent expense entailed, cases of Consumption are for the most part excluded from the

general Hospitals; while the Institutions which at present exist for their reception do not merely fall far short of the actual requirements, but they are designed upon the wrong principle—namely, that of large buildings and wards; and some of them are placed in the wrong situations—namely, in towns and cities, instead of near the sea.

No doubt, the existing Institutions, in removing so many poor sufferers from the crowded, dirty, and close courts and alleys of our large cities, in placing them in spacious, fairly-ventilated, and cleanly wards, in furnishing them with nourishing diet and kind and skilful care and treatment, do a great and good work; but they are far from effecting all the good which may be accomplished. It has been well established that there are no more fertile causes of Consumption than unventilated workshops, overcrowded barracks or other buildings, badly-constructed dwellings, and a deteriorated, vitiated, or poisoned atmosphere. On the other hand, it has been equally well ascertained that there are no remedial agents so beneficial in the treatment of Consumption, Bronchitis, Asthma, and other Chronic Lung Diseases, as plenty of light and air, especially sunlight, and a pure, soft, and freely-circulating sea-air. Now, these it is not possible to obtain in their full abundance and perfection in large public buildings or Hospitals, situated in populous towns and cities.

For these reasons, and acting on the advice of several distinguished Physicians, it is proposed that the Hospital be built upon the Cottage principle,—of which, in fact, the aim should be to make it the model. Thus the patients would be scattered through a series of cottages, situated in a locality well sheltered from the prevailing winds, constructed upon the most approved sanitary principles, and surrounded by gardens: in these Cottages the patients would enjoy the advantages of plenty of light and sea-air, of effective ventilation, and as far as possible of a regulated temperature, of large and separate sleeping-rooms, of a lovely landscape and sea-view; and they would, moreover, experience all the comforts and conveniences of home, in place of being con-

gregated in one large building, and subject, in consequence, to many depressing and injurious influences. To complete the plan proposed, the erection of sixteen Cottages, having a suitable Chapel in the midst, is contemplated; each Cottage would furnish Hospital accommodation for six persons, and the cost of building would be about £500. Should any charitable person take upon himself the cost of building one or more of these cottages, certain privileges as regards admission will be conferred; and they would, if desired, bear the name of the benevolent donor.

It is not expected that sufficient funds will at once be forthcoming to provide for all the requirements of a large Institution. We shall be content to follow in the wake of other Sanatoria, and, like them, from small beginnings, grow into a large and noble Establishment—a result which, under proper regulations, will certainly ensue.

Furthermore, it is intended, after the pattern of the Bournemouth Sanatorium, that 'THE VENTNOR HOSPITAL' should be in part self-supporting, and that a certain proportion of the inmates should contribute their quota towards the cost of their maintenance.

It will be readily perceived that the plans and objects of the Ventnor Hospital for Consumption and Diseases of the Chest, and of the Isle of Wight Infirmary, are entirely distinct; and that the one institution cannot be made to supply the place of the other, from locality and a variety of other considerations. The Ventnor Hospital, though situated in the Isle of Wight, will be by no means an exclusively local institution,—the recipients of the benefits of the charity coming from all parts, much of the pecuniary support obtained will also be derived from the whole Kingdom. The Hospital will, in fact, be entitled to be regarded as a National Institution.

VENTNOR,
June 1, 1867.

From the Lancet, *June* 22, 1867.

'THE VENTNOR HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.

'There are few spots, if any, in the British Isles more highly favoured than is the Undercliff, and indeed the whole Isle of Wight. The beauty and picturesqueness of its scenery and fertility of its soil have led to its receiving the appellation of "The Garden of England"; while the many advantages of the situation, soil, and climate of Ventnor and the Undercliff have occasioned the bestowal upon this particular portion of the island by a very distinguished physician, Sir James Clark, of the title of "The British Madeira." Indeed, it is to the writings of Sir James Clark that the Undercliff first owed its reputation, and which, being well deserved, it has since maintained and increased.

'With so many advantages of scenery and climate, the latter specially adapted to cases of phthisis, and in these days of seaside and convalescent hospitals, it is singular that Ventnor should still be without an institution for the treatment of the sick, in which they might participate with the more affluent and wealthy visitors in the many benefits which in such a locality it would doubtless confer. This want has presented itself to Dr. Hassall during his residence in Ventnor, and, as we learn from a preliminary prospectus which has been prepared, that gentleman is now engaged in the task of founding "THE VENTNOR HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST." This undertaking is one not merely of local, but even of national importance, since the recipients of its benefits will come from all parts of the kingdom. The work, therefore, of aiding in the establishment of such an institution is one in which all classes and parties, not merely in the Isle of Wight itself, but elsewhere throughout the Kingdom, may freely join. It is Dr. Hassall's intention to place the matter, so soon as the formation of the hospital shall have progressed to a certain extent, in the hands of the Committee of

Management. We trust that Dr. Hassall will be well supported in his arduous and praiseworthy endeavour.'

From the Isle of Wight Advertiser and Ventnor Times, *June* 29.

'The idea is no longer one vaguely floating in an atmosphere of probable probabilities, but is one that has been fairly launched, and by a gentleman who has recently become a resident among us, whose name and whose professional associations are a tower of strength to any scheme he may adopt—we refer to Dr. Hassall.

'We see by the prospectus issued that it is intended to make the institution partly self-supporting, receiving individuals whose means are limited, at such a charge as they may be able to pay. This will be an inestimable advantage to many a family of moderate income, as not only will the individual charge be much reduced, but the comforts provided by the institution will make it unnecessary that additional expense should be incurred by the accompaniment of the invalid by some other member of the family. Then for those who have no means, but who must perish because the cost of a sojourn in some health-giving spot is impossible to them, we need hardly say how large a blessing such a provision is. In many cases it may become the life-spring to the parent of a dependent family, and thus the means of saving that family from destitution! Such an institution must commend itself to the liberality of those who possess the means to help such a charitable work. It is one, too, in which we think the clergy of the island may be expected to take a great interest—also our members of Parliament and the several local authorities, if they will, may in many ways help forward so good a work. The undertaking is, we know, one which has already [involved], and will yet involve, still more so, anxiety and labour to Dr. Hassall, and he may well claim the support and sympathy of the dwellers in this town; for such an institution established here would be of unquestionable advantage to Ventnor, as affording a constant means of keeping its special advantages before the

medical profession, and thus increasing, to a large extent, the number of winter visitors, especially.

'We confidently hope that Dr. Hassall will find himself very speedily surrounded by a goodly band of coadjutors, as the work, successfully carried out, will contribute largely to the alleviation of the sorrow of many an afflicted home.'

From the Lancet, *September* 7, 1867.

'A few weeks since we directed attention to the fact that Dr. Hassall was occupied in the establishment of a Hospital for Consumption and Diseases of the Chest in the highly salubrious and suitable locality of the Undercliff. We, at the same time, took the opportunity of expressing a favourable opinion of the project. From a prospectus submitted to us it appears that Dr. Hassall has made most satisfactory progress with the undertaking; and that he has already received the co-operation of a large body of highly influential supporters.

'The proposal presents several features of interest and importance, which serve to give it a distinctive character, and go far in themselves to ensure success.

'The opinion has gained ground of late—and it is one we cannot do otherwise than endorse, since it is based alike upon physiology and practical experience—that an error has been made in placing patients labouring under consumption in large buildings and wards located in the midst of towns and cities, and that the reverse plan is that which ought to have been pursued; that they should have been located within reach of sea-air, and have been as much separated as possible. This important consideration has been very strongly urged in the prospectus of the Ventnor Hospital for Consumption and Diseases of the Chest, to which we refer the reader.

'Obviously the scheme is one which has been well considered, and we congratulate Dr. Hassall on the progress made. It would have been very difficult to find anyone better qualified for carrying out a project of the kind to a

triumphant issue, from his well-known energy, his knowledge of sanitary requirements, and his experience of many years as Senior Physician to the Royal Free Hospital.

'We notice with satisfaction that the President of the Hospital is Viscount Eversley, late Speaker of the House of Commons, and now Governor of the Isle of Wight; that the Chairman of the Committee of Management is Sir Lawrence Peel, President of Guy's Hospital; while amongst the Vice-Presidents we are glad to recognize the name of Sir Charles Locock.'

A Much Later Press Extract.

'THE CONSUMPTION CURE.

'GOOD RESULTS OF THE OPEN-AIR TREATMENT.

'Phthisis, according to the latest return of the Registrar-General, accounted for 40,251 deaths in England and Wales in one year (at the rate of 1,300 per million living). In addition, 93,490 deaths occurred from other diseases of the respiratory organs. And yet consumption is not incurable, as the "open-air" treatment has proved.

'This mode of treatment was referred to by Sir Richard Webster, Q.C., Chairman of the Board of the Royal National Hospital for Consumption, at the annual meeting yesterday. He said he had been much amused by certain sections of the Press making the sudden discovery of its undoubted advantages.

'As long ago as 1868 Dr. Arthur Hill Hassall recognized the curative powers of fresh air and sunlight, and the evolution of this principle had been the careful study of the administration of the hospital.

'The Royal Consumption Hospital is built in blocks, with a separate bedroom for each patient. A constant current of fresh air is drawn mechanically through each apartment at the rate of 5,000 cubic feet per hour per patient, this air being tempered in cold weather by passing through a steam-heated coil.

'The result is that the published statistics of cures of the hospital compare most favourably with those of the leading German sanatoria, and that notwithstanding the much more favourable nature of the cases, as regards stage of disease and physical condition, which enter the latter class of institution.'—*The Morning Leader*, February 24, 1899.

II. *Resolution passed by the Board of Management after Dr. Hassall's Death.*

The following appears in the 'Short Historical Description of the Ventnor Hospital' prefacing a pamphlet issued officially in 1895, and containing the *Twenty-sixth Annual Report* of the Board of Management:

'To Dr. Arthur Hill Hassall belongs the honour of being the Founder and first Consulting Physician of the "Royal National Hospital for Consumption and Diseases of the Chest." . . . In the very heart of this favoured spot Dr. Hassall chose a site for this noble institution. To his untiring energy and indomitable perseverance its foundation is due. He laboured perseveringly and unremittingly during the earlier years of the history of the hospital, and personally promoted the welfare and happiness of the inmates.

'He had the happy satisfaction of seeing the hospital grow in size and importance, and till his death (in the spring of 1894) took the keenest interest in its welfare.'

And the following Resolution, passed by the Board of Management, is included in the Report in question, which was presented to the Governors of the Hospital at the Annual General Meeting on February 14, 1895:

'*Resolved*—

'That the Board of Management desire to place on record their sincere sorrow on learning the great loss which this Hospital has sustained through the death of the Founder of the Hospital, Dr. Arthur Hill Hassall. The Board mourn his death both as the Originator of the Hospital and as a Colleague whose great ability and unremitting attention

brought the Hospital to such a high state of completeness as to be a model of what a Hospital for Consumption should be; and they feel that his name will ever be remembered as that of a Benefactor to the sick and suffering.'

III. *Unveiling the Founder's Portrait.*

From the Isle of Wight Advertiser, *Saturday, October* 20, 1894.

'INTERESTING CEREMONY AT THE ROYAL NATIONAL HOSPITAL.

'HONOURING THE MEMORY OF THE FOUNDER.

'On Monday afternoon, in the presence of a large and influential assemblage, an unusually interesting ceremony was performed in the large dining-hall of Block XI.—viz., the unveiling of a memorial portrait of the founder of the institution, Arthur Hill Hassall, Esq., M.D. (Lond.), M.R.C.P. (Lond.). A temporary daïs had been erected, and the hall was gaily decorated with flags and evergreens. The Chairman of the Board of Management, Sir Richard E. Webster, G.C.M.G., Q.C., M.P., presided, and he was supported on his right hand by Dr. Paul and Miss Webster; on the left by Dr. Sinclair Coghill, Neale F. Horne, Esq., Deputy-Chairman, Mr. Ernest Morgan, secretary, Mr. G. Powell, P. B. Burgoyne, Esq., T. H. Urry, Esq., R. Pope, Esq., Dr. J. M. Williamson, Dr. R. Robertson, Rev. R. W. Odell, and the Rev. J. A. Alloway, chaplain. Amongst others present we noticed Viscount St. Vincent, Revs. J. B. Blackmore, Professor Llewellin, W. Sells (Rector of Niton), J. N. Rootham, R. B. Oliver (Rector of Whitwell), P. H. R. Bartlett (Vicar of Godshill), A. G. Fryer (Shanklin), and J. Raven; Dr. Davey, Drs. Lewis and Fraser (resident medical officers), Colonel Stewart, Colonel Moore Brabazon, Mr. Archibald, Mr. H. Sewell, Mr. E. Walford, Mr. J. Henderson, Mr. Evan Jones, Mr. Fletcher Moor, Mr. T. Gell, Mr. J. S. Ineson, Mr. H. Ware Whitbread, Mr. Cole Norman, Mr. E. G. Clayton, Dr. J. H. Bell, Mr. C. A.

Webb, Mr. J. C. Richardson, Mr. Lance Calkin (the artist), Mr. T. A. Raynes, Mr. J. Morton, and Major Payne (the General Superintendent); Mrs. Williamson, Mrs. Pope, Mrs. Paul, Mrs. Henderson, Mrs. Mackay Sutherland, Mrs. Bell, Mrs. Burgess, Mrs. Cole Norman, Mrs. Mackay, Mrs. Raven, Mrs. Rootham, Mrs. Fryer, Mrs. Ineson, Mrs. Whittam, Mrs. W. G. Whittam, Mrs. Chas. Russell, Mrs. G. Banister, Mrs. E. G. Clayton, Mrs. Ashdown, Mrs. Westropp, Mrs. Sells, Mrs. Moore-Brabazon, Miss F. M. Deivé, Miss Stockwood, Miss C. A. Hennell, Misses Raynes, Miss K. E. Lloyd, Miss Pierce, Miss Nicholson, Misses Urry, Misses Coghill, Miss Harvey, and many others whose names it was impossible to ascertain.

'The proceedings commenced at 3.30 with a Prayer led by the Rev. J. A. Alloway, Chaplain to the Hospital.

'Sir RICHARD WEBSTER, who was received with loud applause, then said: "Ladies and Gentlemen—The occasion on which we are gathered together to-day is one of considerable interest, not only to those of us who are connected with this hospital, but to those of us who have had the privilege, publicly or privately, of the friendship or acquaintance of the very eminent man whose portrait is to be unveiled to-day. A great deal of time might usefully be occupied by those who are interested in medical knowledge and medical science, by a study of the work of Arthur Hill Hassall, but it is not my purpose, nor is it necessary for me, perhaps it is not fitting for me on the present occasion, to say very much in detail regarding his work; but still, inasmuch as his early training and his professional career had not a little to do with the hospital, and the inception of the design of the hospital—the culmination of which design and fulfilment of his hopes brings us here to-day—it may be fitting publicly to refer to one or two incidents in his career, and one or two matters showing how wide was his knowledge, how vast his information, and with what prudence he brought to bear upon public questions the results of his own research, and of the knowledge that he acquired from the researches of others. Arthur Hill Hassall was born on December 13, 1817, and

I will say no more of his life or his education prior to the time of his commencing his career in the medical profession, beyond the fact, rather interesting and significant in its way, that when he determined to commence his medical studies, under the patronage and support of a very distinguished relative, he went to Dublin, and on the occasion of his having to go to Dublin, there being then, in the year 1834, no railways projected to the extent they are at the present time, he travelled from London to Dublin by steamer, and the journey took between five and six days. It struck me, when I was reading through some of his notes of his life, it was a remarkable circumstance as showing the change that has taken place during the period of sixty years,—that the journey from London to Dublin by sea then took about the time that a journey from Ireland to America takes in the present day. Perhaps if we were to parallel the changes that have taken place in many other sciences, many other professions, results quite as remarkable could be mentioned and multiplied many times over. It was not long after his professional work had really commenced, that his attention was directed to many of those studies which, as I have said, had a marked influence upon his life. He was, from his earliest years, at any rate from his earliest professional years, an ardent student of natural history, but probably he, more than anyone of the medical profession [recognized], at any rate, he was among the first to recognize, the enormous value of the microscope. I should be ashamed to say in the presence of so many medical men, or enforce by illustrations that which so many know much better than I, but it is not asserting too much, that probably there is nothing that has done more for the health of our people, for the prolongation of human life, and for the destruction or cure of disease, during the period of the last twenty-five or thirty years, than the microscope. It is a significant fact that Dr. Hassall was one of the first to recommend, at any rate, to attempt to recognize and work out what could be done by the microscope, and in connection with his 'Microscopical Anatomy of the Human Body,' there is no doubt that he

laid the foundation of many of those researches by which his knowledge subsequently enriched the medical profession. Perhaps, however, he is better known to the general public by his researches in connection with the Adulteration of Food, where, of course, the microscope played a very prominent part; and those of us who have had occasion from time to time to trace the history of Acts of Parliament which have had to do with the prevention of the adulteration of food, will have been struck by the effect of the labours of those men who took part with Dr. Hassall in endeavouring to ascertain the causes of impurity, and to secure safeguards against their recurrence. In connection with this, many of you whom I address know the active part he took in the condemnation of the impure London waters, which spread disease to so many thousands—I might almost say to tens of thousands—of the inhabitants of the Metropolis. He was, perhaps, one of the foremost witnesses who condemned this contaminated water-supply of London, and by his testimony, and his untiring advocacy, brought about a better state of things. So, again, at the time of the great cholera epidemic, which many here cannot remember, but still there are many who can, he was foremost in endeavouring to discover the cause of the disease, and certainly modern scientific discovery has not in any way shown that he was treading otherwise than on the right path. As I must pass from what I may call these incidents of his life, I should like to conclude them by saying that I was wonderfully struck by the enormous variety of his knowledge and his great powers of generalization. I believe that between the years 1840 and 1892 he communicated or wrote to scientific bodies upwards of 100 books and papers (many of those books will take their place as standard works, and many of those papers required very great research), which enabled persons who had not opportunities which he had taken advantage of, to grasp the existing position of difficult questions that were before the public, and tended in no small extent to solve difficulties as they arose. I am aware, ladies and gentlemen, that this mere sketch and outline of his work is, of course,

singularly imperfect; but, as I have said, it is neither the time nor the place to engage the attention of such an audience as this by a more minute, or detailed, or scientific, or critical examination of his work, as to parts of which question might arise, and the details of which would not be suitable for such an occasion. But having told you what was the training and what was the work of the man, one's mind naturally turns to those incidents which connect his name with this institution—this noble institution, within the walls of which we are assembled. In the year 1866, Dr. Hassall had a very serious illness, which was at the time thought so serious that it was believed it would terminate fatally; and surprise was often expressed at his living so many years, practically for about twenty-seven or twenty-eight years afterwards, and in, comparatively speaking, good health. This illness, which necessitated his leaving London, brought him first to Hastings, and subsequently to the Undercliff; and it was from a consideration of what were the requirements and necessities of consumptive patients, that Dr. Hassall was led to design and to propose the scheme which has resulted in the establishment and maintenance of this hospital. There had been many institutions that had been framed, to a certain extent, upon this model. Its plan and mode of working had attracted the attention of distinguished scientific men from many foreign countries. But what Dr. Hassall insisted upon was that there should be a treatment of consumptive patients upon the separate system—that is to say, that (as you know has been carried on in this hospital) there should be a number of detached houses, in each of which should be located, or in each of which for the time being six or eight patients should dwell, and that each should have a separate sleeping apartment, and that there should be an ample supply of warm, fresh air and sunlight, and all these things are impossible to get except under the most favourable circumstances. Speaking of such a disease, and the consequences of which have been so often pointed out in the history of medicine, results are often of a somewhat depressing character; but one might

fairly say that those of us who have had the opportunity of studying the records of this hospital know what has happened to men and women who have been here, and have returned again—nothing has occurred in any way to cast the slightest doubt upon the skill and prudence of the original design by Dr. Hassall. I don't know that in any feature we have had occasion to depart from his plan. Minor improvements in matters of detail, of course, there must be, and I hope there ever will be. We should be indeed poor students if we were not able from time to time to avail ourselves of the march of knowledge, and improve in such matters as occur from day to day in the management of such an institution as this; but it is a fact, on which the Board of Management may naturally, to a certain extent, congratulate themselves, that during the period of twenty-five years—the first patient having been admitted about October, 1869—up to the end of 1893, 12,516 patients have passed through this hospital, with results of great advantage to a very large proportion of them. Ladies and gentlemen, we are assembled here to-day to do honour to the memory of Arthur Hill Hassall. We should not at the same time, and on such an occasion, forget to mention some others who were associated with him in the inception of his work. During the period of the last few months the death has occurred of one to whom this hospital owes a considerable debt, and that was Mr. Thomas Hellyer, of Ryde, who worked out the plans which Dr. Hassall *himself* designed. Then, many here will remember the liberality of Mr. Leaf, and the support of Lord Eversley, of our treasurer, Mr. Colman; and, speaking of those who have passed away, of the great services of my friend Mr. Herbert Saunders. I feel that it is right that these names should be associated and mentioned as standing out prominently in relief, those to whom much of the success of this hospital is due. We are thankful to know that many who took an active part in the early work of this hospital are among us still. Our friend Dr. Paul (applause) was associated with Dr. Hassall from its earliest days. Mr. Frere, unfortunately, is not able to be with us, but he is still

living, and he was one of the most active supporters in the first instance. We have here Mr. Neale Horne, who has done such genuine work as deputy-chairman, and we have also the great pleasure of knowing that the Rev. Arthur Peile, who was for many years in Ventnor, and so much respected, but now living in London, has always and will take a great interest in the hospital. There are some here in the room whose names can be mentioned, not perhaps as having been connected with the hospital from its very commencement : but if there are such, I hope they will accept my apology for my research not having been sufficiently minute to have discovered the fact. Also there are those here who have been for so many years associated with the hospital that they may be almost regarded as among its first supporters. One other matter rises to one's mind on this occasion, and that is respecting the future of this hospital. One cannot help endeavouring to make in some way on this occasion an appeal to those who are present, and through them and through the Press to the public outside, for enlarged and increased support. Those who are acquainted with the working of the hospital and its results, to which I have briefly alluded, will be satisfied that it is an institution which is deserving of support, and has done great good to a large number of our suffering brethren and sisters. When I remind you that the expenses of this institution, without regarding extension, or sudden and exceptional repairs—the outlay of the day by day expenses of this hospital—are £11,000 a year, and that our annual subscriptions are only £2,278, our dividend £1,691, on investments, and the payments from patients £3,437, making a total of £7,306, you will see how largely we depend, and are obliged to depend, upon casual or unexpected sources of income to make up the deficit, as we cannot rely upon a fixed income. Without them the Board, indeed, would be obliged to contemplate the necessity of closing blocks that have previously been open. I would appeal to those who hear me, and to those with whom they come in contact, to let the work of this national institution be known,

because, it must be remembered, it is not confined to this locality. On the contrary, probably its benefits have been most largely received by those who come from our large and populous towns in the north of England, on whom the change of climate, and of scene, and of changed circumstances of their life, have had a marked effect for good. . . . I trust that this occasion may prove to be again a starting-point, from which we shall be able to mark increased prosperity, increased usefulness, and increased benefits, resulting from our work. I don't know, ladies and gentlemen, before I ask my sister, Miss Webster, who has been kind enough to help us to-day (applause), to unveil the portrait, that I could close what I have to say better than in the words of our Most Gracious Sovereign, which have been for years printed upon these walls, that our earnest wish and hope would be—

'"'God grant that the pure and health-giving climate of this beautiful district may be blessed to the restoration of all who shall be admitted to this noble institution.'

'"That wish, which we may all reciprocate, cannot be too often before the minds of those who have to do with its work and with its interest, and it is in that spirit that I commend to those who hear me, the success and future of this our national hospital: I trust and hope that I shall not commend these interests in vain." (Loud applause.)

'Miss Webster then drew aside the curtain, and disclosed, amidst applause, a very beautiful oil-painting and lifelike portrait of Dr. Hassall.

'Sir RICHARD said he had not had the pleasure of seeing the picture before, but he was proud to say that Mr. Lance Calkin was present that afternoon, and he was quite sure that all who knew Dr. Hassall by sight, and especially his intimate friends, would join with him (the speaker) in offering their congratulations to Mr. Calkin on the work he had produced, and the striking and typical portrait of Dr. Hassall which they saw before them. (Applause.)

'The inscription beneath the portrait is as follows:

ARTHUR HILL HASSALL,
M.D. (LONDON), M.R.C.P. (LONDON),
FOUNDER OF THIS HOSPITAL.
NON OMNIS MORIAR.
PRESENTED BY FRIENDS AND SUBSCRIBERS.

'Dr. COGHILL said he had had a very pleasing task confided to him, and that was to ask all present to accord a cordial vote of thanks to Miss Webster for so kindly consenting to take part in these proceedings, and for so gracefully discharging her duties on that occasion. It was very proper that Miss Webster should have taken so leading a part in the ceremony, because she was associated with her distinguished brother, who took such a cordial interest in the work and success of the institution. (Applause.) It had been suggested to him that he should make a few remarks in that connection on the medical part of the work of the hospital, more especially since the departure of Dr. Hassall. It was now nearly twenty years since he succeeded Dr. Hassall there, and he, in association with his colleagues, had endeavoured to make the progress of the hospital reflect the general progress of medical science. This had been a very hard task, because medical science had largely shared in the enormous jump into activity into which all the sciences and arts had been plunged, especially during the last quarter of a century. When he came to the hospital, that now familiar instrument, the thermometer, was practically unused and unknown, and nursing was not what it had now become. At the present moment they had their nursing department in a state of the most efficient activity. Not only did the patients derive the benefit of their services, but their able matron had inaugurated a system of probationers, by which they were enabled to train their own nurses, and to send out to other institutions. The nursing of consumptive patients was one of the most important things in promoting their

health. They were the most interesting of all classes of patients to treat. He assured them that during the twenty years he had been there, the interest and pleasure of his work in that hospital had increased from year to year. Their patients were not similar to those in general hospitals — the old, querulous, dissipated, and hopeless: but they were nearly all young and hopeful; in fact, hopefulness was one of the leading features of their ailment. But, strange to say, the delicacy of physical constitution, which was characteristic of consumptives, had associated with it an extremely gentle, sweet, and sympathetic nature; and those who worked amongst them had their labours much lightened by help, which, by this mental condition, they got from their patients. He might also refer to the very great improvement that had taken place in the heating and ventilating of these large buildings. As the Chairman had very properly pointed out, fresh air and light were two of the greatest necessities in the treatment of consumptive patients. Every patient had 5,000 cubic feet of pure and temperate air introduced per hour, not only into the bedrooms, but into the lobbies, and in the sitting-rooms throughout the hospital. They had fixed upon this amount of fresh air as largely in excess of necessity, but so efficient was the work of their machinery in the hospital, that there was hardly a room in which the amount of foul and vitiated air extracted was not considerably more than the amount stated. As the foul, vitiated, used-up air was withdrawn, the same machinery drew in from the outer atmosphere fresh air, which was passed over some heated coils, and came into each apartment to bring it to the proper temperature for the respiration by the patients. One of the highest authorities, competent to make such a statement on heating and ventilating, had stated in a recent report that he knew no public institution or building in existence in which the heating and ventilating was so perfect as at that hospital. In all the changes and improvements that they had endeavoured to effect in the hospital, he was pleased to say that any reasonable request from the medical members of the staff had always met with the most cordial response

from their colleagues on the Board of Management, and the friction between the lay and the medical element, so often the cause of retarding work in other institutions, had been entirely absent. He thought that had largely conduced to the success with which that hospital had appealed to the support of the public, and he had no doubt that those who came after him would endeavour, as he had always endeavoured, to carry out the principles on which the founder inaugurated that institution. (Applause.)

'Mr. NEALE HORNE, the Deputy-Chairman, said it was a great privilege to him to second the resolution, as he had the opportunity of being associated with Dr. Hassall in the earliest days of the institution. Well did he remember his visit to that site in June, 1868, when not a sod had been turned. The previous day they had a banquet at the Cannon Street Hotel, over which the late Sir Lawrence Peel presided, and stated what was intended to be done, and he pointed out to him (the speaker) what his ideas were. They had then £1,500 only received, with about a further £1,000 promised. Thirteen months afterwards he again visited the hospital with Dr. Hassall—in fact, he spent a month at his house. They would feel that they had not allowed the grass to grow under their feet, for the plan had been prepared, the builders had been selected, and the first block of houses had been built; and on that day Her Royal Highness Princess Louise, on behalf of Her Majesty, came to lay the foundation-stone of the second block, and in the following October the first block was opened for the reception of patients. On Sunday week they hoped to have a special service in the chapel, at which, so far as there was room, they would be glad to see the friends. It would be the twenty-fifth anniversary of the first patient being received into that hospital; therefore with specially thankful hearts they praised God for all His mercies. Might he be permitted to remind them that that would be their silver wedding, and it was very frequently a very pleasant task to present to those who had celebrated their silver wedding some little gift? Their Secretary, Mr. Ernest Morgan, who had so ably conducted the

work for upwards of twenty years (applause), would be able to tell them what was most wanted. They had many wants, and they had had to look around. After all, they had got what they had by asking, and therefore they must not be too modest. There was one thing that visitors must especially notice. Their chapel, beautiful as it was inside, looked so bare without a spire! What a nice memorial it would be if someone would say to the Chairman: "I shall be very pleased to build a tower or a spire." He could not help thinking of one or two names in the year when Dr. Hassall came there as an invalid. One gentleman, staying in the town more for pleasure than for health, the late Mr. Frederick Leaf, who had a large business establishment in the City, felt, when he heard about that new hospital, that it was just the place for those young men and women, who were employés in his establishment and other houses of business, who were laid aside by sickness and phthisis. He felt that Brompton was not quite the place for them. Mr. Frederick Leaf succeeded Colonel Verner (who had passed away) as treasurer, and he was succeeded by Mr. Colman, who, they would be pleased to hear, was in improved health, and was taking an active interest in all that was going on, but he felt a few months ago that he could not continue the work, and resigned the post, to which they had appointed his son, Mr. Charles Colman, and it was pleasing to him to meet around the Board table Mr. Arthur Leaf and Mr. Charles Colman, sons of those who were amongst the early supporters of that institution. They remembered the great interest the late Bishop Wilberforce took in the hospital. Some of them remembered the thrilling speech which he made in Willis's Rooms, in response to which Mr. W. Leaf said, "I will find funds for the sixth house," and thus the third block was completed. Nor could they forget one name which in England was always honoured for acts of benevolence—the name of Rothschild. Well did he remember, for instance, the interest the Baroness took in a bazaar they were then starting in London. When the day of the bazaar arrived, the Baroness was too ill to leave her bedroom,

and in her stead Miss Hannah Rothschild attended. She was better known as the Countess of Rosebery, whose loss they all deplored, and thus it was that Lord Rosebery became their President in succession to Viscount Eversley, whose portrait was on the west wall of that room. Another name they must not pass over. A gentleman was driving past the hospital some few years ago with his valet, and it was suggested that he should visit the institution, but he said, "They would not take the trouble of showing me over." However, he did go, but did not leave either his name or a donation to the hospital, and they hardly knew of his visit; but two years after that they were informed that John Jones had died, and had left the hospital as his residuary legatees an amount which was indeed large, and through that amount they were enabled to meet together that day in that noble hall. But one mistake seemed to get abroad, and that was that they received so much money from the late John Jones that they did not need more. That, as the Chairman had pointed out, was indeed a great fallacy, as, roughly speaking, their ordinary expenditure was £11,000 per annum, and there was generally an extra thousand wanted for additional expenditure. Their patients' investment brought in £5,000, their annual subscriptions £2,000, so they had to raise between £4,000 and £5,000, which in these days of commercial depression was no easy task. They commenced this year with £500 borrowed from their bankers, and he was glad to say they had paid that off; but they found that to meet their ordinary bills they must raise another £1,000 in donations before the end of the year, and he trusted that all present would mention the fact to their friends, so that when the 31st of December came, they would not have to part with any of their investments, or to borrow from their bankers. To whom were they indebted for all this? Certainly to Dr. Arthur Hill Hassall, whose portrait had been unveiled that day. Some of them would remember his indomitable pluck, energy, and perseverance. He had, as all founders had, some obstacles to encounter, but difficulties only existed to be overcome; and were Mr. Hellyer present that day,

he would say that the one who assisted him as architect, although he had carried out the plans, yet the one who suggested everything was Dr. Arthur Hill Hassall himself. (Applause.) There was an inscription of three words beneath the portrait, and they were the motto, "Non omnis moriar" ("I shall not all die"). No words could be more appropriate. His body had been laid in the grave at San Remo, but his work was there—in fact, they were reminded of the well-known epitaph of the architect of St. Paul's Cathedral, Sir Christopher Wren, "Si monumentum quæris circumspice." They were glad to see so many friends present who were connected with Dr. Hassall in the early days, and he wished Dr. Paul had himself consented to second the resolution—but he said he was not so young as he used to be—as he was one who worked with Dr. Hassall twenty-five years ago. They were glad to see Dr. Davey, of Ryde, present, who was one of Dr. Hassall's friends, and also Mr. Fletcher Moor, who was one of the first life-governors, and there were others whose names he should like to mention. They did not want to make the proceedings long, in order that, having had a cup of tea or coffee, they could inspect some of the blocks, so that they could judge for themselves of the arrangements of the hospital. He had great pleasure in seconding the resolution, and he would ask as many as possible to kindly sign their names in the visitors' book, as a memento of that day's proceedings. (Applause.)

'The resolution was carried with acclamation.

'Sir RICHARD WEBSTER said that as his sister was not a member of the Women's Rights Association, she had a great objection to speaking in public. Ladies, as a rule, did not like public speaking, but they had no difficulty in speaking at home. If there was an accident on the part of the master of the house he found the ladies could speak well and freely, and their words sank deeply. Miss Webster had made it a condition that she should not be called upon to make a speech: therefore on her behalf he thanked all extremely for the reception they had given her. He ventured to say on behalf of every member of his family that they were only too

proud to assist any good work in the Isle of Wight or anywhere else. (Applause.)

'Tea, coffee, and other refreshments were liberally supplied, after which the visitors' book was signed by many of the friends, and the interesting proceedings terminated. The band of the Ventnor detachment of Volunteers, in review order, were stationed on the south terrace garden, and performed several selections, both previously to and at the close of the ceremony.'

'. . . The institution is, indeed, a memorial of imperishable worth to Dr. Hassall. Little, indeed, can any who were not with him conceive the unceasing toil and energy that brought about the grand result! And . . . most remarkable in so short a space of time! Thousands upon thousands of letters were written by Dr. Hassall, and a correspondence was created that cannot be measured except by looking upon the Institution and remembering the gratitude of thousands of patients helped.'—*Ibid.* (leading article).

See also accounts in the *Isle of Wight Observer*, October 20, 1894; the *Daily Telegraph*, October 16, 1894; the *Daily News*, October 16, 1894, etc.

APPENDIX E.

The Memorial Service at San Remo.

On Tuesday, April 9, 1895, the first anniversary of the death of Dr. Arthur Hill Hassall, a Memorial Service was held at San Remo, in All Saints' Church. A large number of sympathizers of all nationalities assembled at two o'clock, several coming from a distance to attend the service.

The pulpit of the pretty church was appropriately decorated with white flowers and violets. After an impressive service by the chaplain, the Rev. H. de Romestin, the sermon was preached by the Rev. Hamilton S. Verschoyle, M.A., from the text (Rev. xiv. 13), 'Blessed are the dead which die in the Lord from henceforth: Yea,

saith the Spirit, that they may rest from their labours; and [for] their works do follow them.'

'The full teaching of this passage,' the preacher said, 'is brought out in the Revised Version in a manner in which it is not in the Authorized Version. In place of the "and," which we find in the Authorized Version, the Revised Version restores the true reading, "for." The fact that the works of those, on whom the blessing is pronounced, follow them, is not something added on to their rest and alternating with it, but is that which constitutes the fulness of their rest. "They rest from their labours, *for* their works do follow them."

'Aristotle, I think it is, somewhere defines pleasure as the "reflex of full, spontaneous, and unimpeded energy." These words may fitly be taken to describe the rest spoken of here. This is the true rest; not the rest of inaction, but that of energy, perfect, spontaneous — that is, not pressed and marred by sense of toil; and unimpeded, that is, from all hindrance.

'Such an idea of rest fitly harmonizes with the thought of him who passed from mortal sight this day last year, and while I would that the task of speaking of my dear friend, Arthur Hill Hassall, had been placed in abler and worthier hands, I cannot but feel a sad pleasure in being called to speak of one by whose friendship I was honoured. He was one who found delight in constant activity. When the activity of earnest study in his early years had fitted him for the noble profession which he so brightly adorned, his activity, while that of study did not cease, branched out into three different directions. First, there was the healing of disease. And here, side by side with the intellectual qualities of acuteness in diagnosis, attention to each varying symptom, skill in determining the appropriate remedies, entered the high moral qualities of gentleness and kindness to those in bodily suffering and weakness; unfailing consideration for and sympathy with those who were suffering the agonies of anxiety. We felt we had in him, not only the skilled physician, but a true friend. And the healing of disease he

not only sought to carry out by his own activity as a physician, but through the founding of the Royal National Hospital for Consumption at Ventnor, he enlarged that field of energy, continues, and will continue, his function of healing. But not only did he seek to heal disease, he sought to prevent it, and in this sphere carried out two other great works of his life : the exposure of Adulteration of Food and the improvement of the London Water-Supply, to which may be added his investigations of the cholera bacillus.

'There was yet another great branch of his activity, which was not only of vast importance as a means towards the prosecution of the other two branches, but was an important end in itself—his scientific studies, pursued in the intervals of his other activities, and carried on even in times of weakness, when illness confined him to the house. I remember well seeing him, at such a time, actively engaged with his microscope and reagents in the pursuit of his chemical investigations and discoveries on the colours of the leaves of plants. I have said that this was an end itself, as well as being a means to other ends. Surely, all who believe in God, and that the universe is His work, should feel this—should regard every scientific investigation as consciously or unconsciously seeking for the revelations of the manner of God's working.

'We know how often Science and Religion have been pitted against one another, and how some theologians and some scientific men have sought to make the supposed conflict a real one. Of these Arthur Hassall was not one. He belonged to the reasonable class of scientific men, who do not regard a training in physical science as a qualification for determining the deep metaphysical questions involved in the discussion of the relations of science to religion. But his attitude to religion was not merely this negative one. He devoutly worshipped God ; he sought in his life to carry out the will of God ; he trusted in Him revealed in Jesus Christ, and had a "hope full of immortality," expressed characteristically just before his death, when he said, "We *cannot* have been placed here for nothing." Never shall I forget

the devotion, the peace, the bright hopefulness of his last Communion a few days before his death.

'But I do not think that his religion and his science were in two separate compartments; rather that in his scientific investigations he was realizing the words of the Psalmist: "The works of the Lord are great, sought out of all them that have pleasure therein," and that on each discovery he made, he would have joined from his heart in the words of Kepler, when discovering the laws of the planetary motions, "O, my God, I think Thy thoughts after Thee." We should welcome every scientific discovery (I do not speak of the pseudo-metaphysical discussion of some scientific men, whose science is excellent, while their metaphysics are bad), as giving greater fulness and greater firmness to our belief in God: greater fulness as showing us something further of the manner of His working, and so being the means of His revealing to us more of His mind; greater firmness, as giving us further insight into the existence of Thought in Nature. So far as the Reign of Law is not recognized in Nature, so far there is in it no revelation of the God whom we worship. the God "in whom is no variableness, neither shadow of turning"; and, on the other hand, the more the Reign of Law is traced, the more strength should be given to our conviction of the Being of the Eternal Mind, the Eternal Thought, in whom the universe consists. "We *cannot* have been placed here for nothing"; in these words our dear friend re-echoed the words of St. Paul, which were so soon to be read over his mortal remains: "Your labour is not in vain in the Lord." It is not a labour which will ever end in nothing, as all labour would if the earthly life were all,—for we know that some day this planet will become uninhabitable, and so our race cease. All earnest work, intellectual, moral, spiritual, contains in itself the promise of immortality to give it scope for endless development. It was said of our dear friend, that no man better deserved the epitaph "Non omnis moriar" ("I shall not all die"). The mortal part has perished, but the immortal spirit lives, and finds its rest in continued activity and ceaseless advance—advance in know-

ledge, advance in intellectual power, advance in wisdom, advance in righteousness and holiness. The source of all such advance here is God, and God is its source in eternity; and as we pray to God for those who are dear to us that they may have such advance here below, so let us pray to Him for our dear friend, who has gone from our sight to another mansion of the Father's house, that he may advance in knowledge, in wisdom, in holiness, and find evermore perfect rest in evermore perfect activity. "They *rest* from their labours, for their works do follow them."'

After the service many of the congregation proceeded to the cemetery, where the grave of Dr. Hassall presented a striking appearance, the marble slab being completely hidden by a number of wreaths and crosses of great beauty.

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